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CONTRIBUTORS

Dr. Harold E. Briggs ("The Early Development of Sheep Ranching in the Northwest") is head of the history department at the University of Miami, Coral Gables, Florida. For a list of his writings on the agricultural history of the Dakotas, see *ante*, 8:44 (April 1934).

Dr. David A. Lockmiller ("Agriculture in Cuba during the Second United States Intervention, 1906–1909") is assistant professor of history and political science at the North Carolina State College of Agriculture and Engineering of the University of North Carolina. He is a graduate of Emory University (B.Ph., M.A.), Cumberland University (Ll.B.), and the University of North Carolina (Ph.D.).

Mr. G. E. Fussell ("Animal Husbandry in Eighteenth Century England") is a member of the Ministry of Agriculture and Fisheries, London, and a Fellow of the Royal Historical Society of England. He is recognized as an outstanding authority on the history of English agriculture and has published many articles on the subject.

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Dr. H. C. Taylor ("The Historical Approach to the Economic Problems of Agriculture") is director of the Farm Foundation and was president of the Agricultural History Society during 1936–37.

Dr. H. C. Woodworth ("A Century of Adjustments in a New Hampshire Back Area") is an agricultural economist at the College of Agriculture of the University of New Hamsphire.

Mr. O. V. Wells ("The Depression of 1873–79") is a member of the program planning division of the Agricultural Adjustment Administration.

Dr. O. C. Stine ("Discussion") is chief of the division of statistical and historical research of the U. S. Bureau of Agricultural Economics.

THE EARLY DEVELOPMENT OF SHEEP RANCHING IN THE NORTHWEST[1]

Because of the life habits of sheep, the relative non-perishability of wool, and its low marketing costs, sheep raising is well adapted to regions remote from centers of population and is favored as a frontier enterprise. While the pioneer aspects of the industry tend to pass away as communication and transportation improve, the above factors, together with the ability of sheep to adapt themselves readily to a wide range of climatic conditions, go several days without water, and thrive on shrubby and weedy types of forage, make it possible to keep them in regions which would not otherwise be utilized.[2]

Except for occasional set-backs, the sheep industry made rapid progress in the United States during the nineteenth century. After 1840 the industry shifted steadily westward with the advance of the frontier. Sheep could be raised at a much lower cost in the newly opened lands of the West, and the distance from centers of population encouraged the production of wool.[3] The total number of sheep in the United States increased from 28,500,000 in 1870 to more than 42,000,000 in 1880. The figures for the West show an increase from 4,666,000 to 18,233,000 for the same decade.[4]

During the early years of the development of the cattle

[1] The term Northwest as used in this article includes the territories of Wyoming, Montana, and Dakota, which came into the Union in 1889 as Montana, North Dakota, South Dakota, and Wyoming.

[2] L. G. Connor, "A Brief History of the Sheep Industry in the United States," American Historical Association, *Annual Report*, 1918, p. 136 (Washington, 1921); F. A. Buechel, *The Commerce of Agriculture*, 376 (New York, 1926); A. T. Steinel, *History of Agriculture in Colorado*, 146–150 (Fort Collins, 1926).

[3] From 1840 to 1860 the estimated cost of keeping sheep in the east was at least twice as great as in the west where the cost of range stock was low, the expense of herding was small, land values were lower, and grass and water were often free. U. S. Department of Agriculture, *Report*, 1862, p. 303–312.

[4] These figures include the Pacific Coast as well as the region east of the Rockies.

industry in the territories of Dakota, Wyoming, and Montana, the sheep industry, although not so important, developed along with it, the sheep being brought in from the south and west.[5] The region with its dry climate, nutritious grasses, and coulees and ravines affording shelter, was as well, if not even better, suited for sheep as for cattle. The sheep industry, with its ability to utilize inferior range lands, opportunity for men of small means, and proximity to cheap foundation stock, gradually gained momentum, even promising to rival the cattle business in certain areas. The sheep industry in the Northwest began and continued on a different basis from that in the East. In most cases it was adopted as a sole or major enterprise, on a ranching basis with flocks of from 2,000 to 5,000.[6]

Sheep appear on the assessment lists of Montana as early as 1866 and on those of Wyoming in 1870. With the completion of the Union Pacific Railroad across southern Wyoming in 1869, sheep moved rapidly onto the Laramie Plains around Cheyenne. During that year, J. S. Maynard shipped in a large flock of fine-wooled Merinos.[7] In 1870 Wyoming had 6,409 sheep, 6,000 of which were in Albany County; and Montana had 2,024 head, 1,400 of them being in Beaverhead County. Wyoming reported a wool clip of 30,000 pounds.[8]

Sheep from California, Utah, Oregon, New Mexico, and

[5] Sheep were driven into western Montana and Wyoming from Oregon and California, while New Mexico was also the source of foundation stock. By 1869 two million sheep were reported within the limits of the Territory of Colorado, more than half the number being in the northern part between Denver and the Wyoming border. *Denver Tribune*, Apr. 13, 1869; *Cheyenne Daily Leader*, June 19, 1868, Apr. 15, 1869; U. S. General Land Office, *Annual Report*, 1869, p. 153; Connor, "Brief History of the Sheep Industry," 137–140.

[6] U. S. Census Office, Tenth Census, 1880, 3:179, 196, 210, 1017–1018, 1019–1021, 1025–1026. Some early cattlemen ran both cattle and sheep, herding the sheep on the rocky and sparsely grassed lands. Steinel, *History of Agriculture in Colorado*, 146–147.

[7] *Butte Daily Miner* (holiday ed.), Jan. 1, 1889, p. 105; *Cheyenne Daily Leader*, June 24, 1869; U. S. General Land Office, *Annual Report*, 1869, p. 153; E. S. Osgood, *The Day of the Cattleman*, 189 (Minneapolis, 1929); Steinel, *History of Agriculture in Colorado*, 146.

[8] U. S. Census Office, Ninth Census, 1870, *Wealth and Industry*, 3:196–197, 284–285.

Nebraska arrived on the ranges of Montana, Wyoming, and the Black Hills of Dakota in considerable numbers during the seventies. Poindexter and Orr, cattle ranchers, located a flock of 2,467 on Blacktail Deer Creek, Montana, in 1871, driving them in from California, and Robert Ford and Thomas Dunn located a flock on the Sun River.[9] A Montana editor, writing late in 1875, reported that the Seaborn brothers brought a flock of about 2,000 from Oregon to the lower Smith's River Valley in Meagher County. "These gentlemen started early and have spent the summer on the road traveling slowly, their sheep in consequence are in good condition to stand the change of climate."[10] In the spring of 1876, the same writer noted that "Messers Crombaugh and Burt are so well pleased with the manner in which their sheep have wintered on Smith's River Valley that they have decided to drive 15,000 head from their ranches near Red Bluffs, California to Montana this season."[11]

The first herd of sheep to be located on the Yellowstone River in eastern Montana was brought in by J. G. Burgess in the fall of 1876. The herd of 1,400 was located on the present site of Miles City. Another flock numbering slightly over one thousand was brought in a year later by George M. Miles, who reported that the increase had been sufficient to pay costs, leaving the wool clip as a profit. The Montana Wool Growers' Association was formed at Helena on September 20, 1876.[12] In 1878 John Healy of San Francisco, agent for a California wool company, established a depot at Helena for the grading and buying of wool.[13]

While small lots of sheep were brought into southern Wyoming from the south and west in the late sixties, sheep ranching as

[9] *Rocky Mountain Husbandman*, Apr. 2, 1885; Maude Ethel Felter, "The Beginnings of the Range and Ranch Business of Montana," 14 (MS., M.A. Thesis, University of Iowa, 1924).

[10] *Rocky Mountain Husbandman*, Dec. 2, 1875.

[11] *Ibid.*, Apr. 6, 1876.

[12] *Ibid.*, Oct. 10, 1876, June 14, 1877; *Butte Daily Miner* (holiday ed.), Jan. 1, 1889; M. S. Alderson, *History of Bozeman, Montana*, 71 (Bozeman, 1882).

[13] *Helena Independent*, Feb. 19, 1878.

an industry did not develop there until the early seventies. At that time E. M. Post and James A. Moore were important sheepmen in the vicinity of Cheyenne. Extensive sheep ranches were also located in the Big Horn and North Platte valleys. In the Black Hills area of Wyoming, there were two large herds, one on Oak Creek numbering 2,700 and one on Sun Creek of some 4,000.[14] The Laramie County Stock Growers' Association, including both sheep and cattle ranchers, was organized in 1873 with ten members. Six years later the name was changed to the Wyoming Stock Growers' Association. The object of the organization as stated in the bylaws was "to advance the interests of stock-growers and dealers in live stock of all kinds within the territory."[15]

Sheep were not introduced as a range enterprise in Dakota Territory until after 1878, and even then the Black Hills was the only section where sheep ranching developed extensively.[16] Among the early sheep ranchers in the Black Hills were J. D. Hale who located a flock of 3,000 on Morris Creek in 1879, and William Lewis who drove in a flock of more than 2,000 on Box Elder Creek the same year. Several smaller herds were scattered throughout the hills region.[17] In 1880 about 15,000 head were driven into the Black Hills, 8,000 coming from Wyoming and 7,000 from Nebraska. The total number of farm and range sheep in Dakota in 1880 was 85,244, of which 23,143 were located on ranches in southwestern Dakota.[18]

[14] *Cheyenne Daily Leader*, Jan. 16, 1874, Nov. 3, 7, 1876; "Report of the Governor of Wyoming Territory," in U. S. Department of the Interior, *Annual Report* (1878) 1:1131.

[15] Wyoming Stock Growers Association, *Proceedings*, 1915, p. 61; *List of the Members, By-laws . . . of the Wyoming Stock Growers Association*, 1886.

[16] In their early practice of mixed farming, the pioneer farmers of the southeastern part of the Territory of Dakota introduced sheep. Newton Edmunds, former governor of the Territory, located a small flock on his farm near Yankton in the late sixties. The Census of 1870 reported 1,901 sheep in the Territory, most of which were in the southeast. *Sioux City Weekly Journal*, Oct. 5, 1868; *Yankton Weekly Dakotian*, Sept. 14, 1869; J. S. Foster, *History of Dakota*, 26–27 (Yankton, 1869); U. S. Census Office, Ninth Census, 1870, *Agriculture*, 82.

[17] *Black Hills Weekly Pioneer* (Deadwood), Jan. 1, 1882; *Yankton Press and Dakotian*, Nov. 24, 1879, Feb. 19, 1880.

[18] U. S. Census Office, Tenth Census, 1880, vol. 3, *Agriculture*, 1020–1021.

In 1880 the Territory of Wyoming had 450,225 sheep, 364,082 of them being in the southeastern section, 75,564 in the west, and 10,579 in the northeast. Approximately 40,000 head had been driven or shipped out of the Territory during the year, while 96,000 had been brought in. Montana reported 279,277 sheep in 1880, 138,857 being in the central part and 88,691 in the west. In 1878 one company drove 30,000 head into Montana from California. In 1880 a total of 136,500 were brought into the Territory, of which approximately 72,000 came from California.[19]

While some of the early sheep ranchers ran their sheep on an open-range basis, the general policy followed was to keep hay for emergency feeding. An English traveler, writing in 1883, made the following observation:[20]

> Sheep are delicate animals compared with cattle and horses, and of course cannot be let run wild as the other stock is, but if a man understands them, will live on the range to superintend his herders, and has a farm where he can put up a good quantity of hay for winter use, he will get more profit out of his three to five thousand sheep than out of the same money expended on cattle.

While the battle of the Little Big Horn in 1876 and subsequent events made eastern Montana, northeastern Wyoming, and northwestern Dakota comparatively safe from hostile Indians, the region was not officially evacuated until 1880 and 1881, when the tribes were gradually moved to the Standing Rock Reservation in Dakota.[21] In 1880 the Northern Pacific Railroad, held up at Bismarck in Dakota Territory since the panic of 1873, began construction westward and reached the present site of Miles City, Montana, early in 1882. It arrived at Billings in August of that year and met the western extension at Gold Creek, fifty miles west of Helena, in 1883. The Union Pacific Railroad, stirred to activity by the possibilities of the

[19] *Ibid.*, 1013–1028. Sheep could be bought in California for from $1.50 to $2.00 per head. A drive took two years, the wool clip practically paying the expenses. Sheep were driven in by the thousands in the late seventies and early eighties.

[20] William Shepherd, *Prairie Experiences in Handling Cattle and Sheep*, 10 (New York, 1885).

[21] *Cheyenne Daily Leader*, May 12, July 7, 11, 1876; *Miles City Weekly Press*, June 4, 1881.

ranching business in western and central Montana, began the construction of a line northward from Corrine, Utah to Garrison, Montana which crossed the boundary in 1880. A branch line was then extended from Garrison to join the Northern Pacific at Butte.[22]

While railroad construction and the removal of the Indian barrier opened up an enormous area of unsettled and unused country and set the stage primarily for the great cattle boom of the eighties, the sheep industry was also given the opportunity to expand and develop. Indeed, general conditions in the early eighties were as ideal for the development of the sheep industry as for cattle. The financial depression of the seventies was over, and capital, both foreign and domestic, was available at reasonable rates of interest. Range sheep were plentiful and cheap, while free range lands could easily be obtained, offering opportunities for men with little capital. Many small cattlemen, unable to compete with the large-scale cattle industry as it developed, turned to sheep ranching.

The Indian hostilities of 1876 and 1877, followed by the Black Hills gold rush, attracted attention to the Northwest. While extravagant claims were made for cattle ranching during the boom period from 1880 to 1886, writers also pointed out the advantages of sheep in the Northwest. In a glowing account of his sheep ranch, R. H. Clendenning of Martindale, Montana, reported an income of more than four thousand dollars in less than a year on a five-thousand-dollar investment.[23] Regular yearly profits of from 25 to 35 percent were reported in the Yellowstone Valley in 1880 and 1881.[24] A reliable observer described portions of Wyoming and Montana as a "sheep-grower's paradise" where wool could be produced as cheaply as any place in the world, and which would soon be famous for its flocks and

[22] *Report of the Governor of Montana made to the Secretary of the Interior*, 1883, p. 11; *Bismarck Tribune*, June 12, 1880, July 21, 1883; *Helena Independent*, Mar. 10, 17, 1880; *Miles City Weekly Press*, Apr. 14, Aug. 7, 1882.

[23] *Rocky Mountain Husbandman*, Oct. 10, 1879.

[24] *The Climate, Soil and Resources of the Yellowstone Valley*, 72 (St. Paul, Minn., 1882).

wool. He reported average profits of from 25 to 30 percent per year, some sheep men making as much as 60 percent on their investment.[25] An English traveler in Montana and Wyoming in 1884 noted numerous advantages for the sheep rancher:[26]

> For men with small capital it will prove nowadays more profitable to keep sheep; the tendency heretofore has been too exclusively to breed for fine wool, but now mutton is much in request, and a big carcase is aimed at.

Early in 1882, a Black Hills editor reported a rapid increase in the number of sheep in that region after 1878, listing ten ranchers with from 2,000 to 6,000 head in 1881, while more than 8,000 head had been brought into the hills that year. The total number of sheep in the hills district on March 17, 1884, was reported as 85,000, Lawrence County having almost two-thirds of the total.[27] The Marquis de Mores, a French nobleman who established a meat-packing plant as an experiment at Medora, Dakota, in 1883, began to run sheep on shares among the ranchers near Medora in the spring and summer of that year. According to some accounts, he handled as many as 12,000 head in this way. The plan collapsed with the failure of the packing enterprise in 1885.[28]

In the spring of 1884, the number of sheep in Montana Territory was estimated at 524,440, with a wool clip of 2,637,000 pounds, while other estimates gave the number as 362,776 in 1882, 465,667 in 1883, 593,896 in 1884, and 968,298 in 1886.[29] By 1881 the number of sheep assessed in Montana Territory exceeded the number of cattle, and Meagher County was the leading sheep as well as cattle county. By 1884 the western counties of Uinta, Fremont, and Sweetwater in Wyoming, were

[25] James S. Brisbin, *The Beef Bonanza; or, How to Get Rich on the Plains*, 93-139 (Philadelphia, 1881).

[26] Shepherd, *Prairie Experiences*, 10.

[27] *Black Hills Weekly Pioneer*, Jan. 1, 1882; *Turner County Herald*, May 10, 1883, Mar. 17, 1884.

[28] *Medora Badlands Cowboy*, Nov. 13, 20, 1884; *Mandan Pioneer* (immigration ed.), Jan. 4, 1884; *Dickinson Press*, July 7, 1886.

[29] *Rocky Mountain Husbandman*, Mar. 20, 1884; *Anaconda Standard Almanac*, 1894, p. 80; Montana Bureau of Agriculture, Labor and Industry, *Annual Report* (1893) 1:276.

predominately sheep counties.[30] The number of sheep in the Territory in 1886 was estimated at 875,000.

After the disastrous winter of 1886–87, cattle ranching as an open-range enterprise broke down completely in the Northwest.[31] Many large cattle companies went into the hands of receivers the following summer and disposed of the remnants of their herds as creditors demanded payment. In some sections heavy shipments during the summer and fall practically cleared the range, and many of the ranchers who remained decreased their herds to what they considered a point of safety. The difficulties of the cattle business were further intensified by declining prices and the pressure of granger farmers and sheep ranchers.[32]

As the cattlemen moved out, sheepmen turned their flocks on the ranges that were no longer capable of supporting cattle. In fact, many portions of the Northwest were better suited to sheep than cattle, since there was considerable rough inferior range land covered with salt sage which was distasteful to cattle but relished by sheep the entire winter. While some of the cattle operators had been gradually shifting even before the hard winter, many of them now went into the sheep business.[33] One rancher in describing the process said: "As most of our neighbors moved out and left us, sheepmen moved in on our lands and were often hard to handle."[34] After heavy losses in the winter of 1886–87, Gibson and Carpenter, pioneer cattlemen in Valley County, Montana, sold the remnants of their herds and crossing the Missouri River, entered the sheep business and soon became the largest sheepmen in that section of the Territory.[35] T. N. Howell, coming into Wyoming from California

[30] Osgood, *Day of the Cattleman*, 189, 230.

[31] R. S. Fletcher, "That Hard Winter in Montana, 1886–1887," *Agricultural History*, 4:123–130 (October 1930).

[32] *Rocky Mountain Husbandman*, Mar. 17, 1887.

[33] John Clay, *My Life on the Range*, 222–224 (Chicago, 1924).

[34] At first the Warren Livestock Company was largely interested in cattle. In 1884, it had only 3,000 head of cattle and horses and nearly 25,000 sheep. In 1889, it had 2,500 cattle, 2,000 horses, 90,000 sheep, and 2,500 Angora goats. It owned all the water on the land that it controlled, and its meadows were securely fenced. U. S. Department of Agriculture, *Report*, 1889, p. 267.

[35] Helena (Montana) Board of Trade, *Report*, 1887, p. 31–32.

in 1888, located a sheep ranch on the Stinking Water River and by 1892 was running 10,000 head of sheep. "Ours used to be a great cattle country," observed Otto Franc, a former cattle king, "but it is mostly sheep now and they are driving the cattle out. I used to run 20,000 cattle on my range, now I run 1,200."[36]

In the decade from 1886 to 1896 cattle herds in the Northwest increased in number and decreased in size, the owners depending more upon winter feeding and less upon the open range. During these years the number of cattle in Wyoming decreased from 900,000 to less than 300,000, the valuation shrinking from $14,651,125 to $3,732,558.[37] The number of sheep increased from 875,000 in 1886 to 3,327,000 in 1900, and 4,580,453 in 1909.[38] In 1898 the number of cattle and sheep in Big Horn County, Wyoming, were 32,605 and 55,489. Two years later, according to a reliable report, there were 21,810 cattle while the number of sheep had increased to 387,014.[39]

Although the decline in the number of cattle was not so marked in Montana in the years following 1886, the increase in the number of sheep was equally apparent. In 1886 the assessment lists showed 663,716 cattle and 968,298 sheep. By 1893 the corresponding figures were 570,931 and 2,254,527, and in 1900, 678,528 and 3,552,081. North and South Dakota, reporting 136,413 and 238,448 sheep in 1890, listed a total of 958,000 in 1900, of which 507,000 were in the Black Hills of South Dakota.[40]

[36] *Billings Gazette*, July 18, 1899.

[37] Wyoming, Governor, *Message of William A. Richards . . . to the Fourth State Legislature*, 1897, p. 30.

[38] Wyoming State Department of Agriculture, *Wyoming Agricultural Statistics*, 1923:39. These figures, based on the assessment rolls, vary somewhat from those given in the U. S. Census Office, Twelfth Census, 1900, *Agriculture*, 5 (1):cciv, 495.

[39] W. D. Pickett, *Big Horn County, State of Wyoming*, 17 (1898); Union Pacific Railroad, *Wyoming; A Complete and Comprehensive Description*, 46–47 (1903).

[40] Montana Bureau of Agriculture, Labor and Industry, *Annual Report* (1893) 1:429–430; U. S. Census Office, Eleventh Census, 1890, 3:591, 621–622; Twelfth Census, 1900, *Agriculture*, 5 (1):ccii–cciii, 456–457, 466–467, 474–475. The sheep industry reached its high point in 1885, after which the number declined gradually. The rapid expansion in the west offset the pronounced decline in other regions. The number in the United States decreased from around forty-three million in 1884 to less than thirty-seven million in 1900. The increase for the west for the period was approximately four and one-half million. Connor, "Brief History of the Sheep Industry," 139.

The first sheep in the Northwest were Mexican stock from Colorado and New Mexico, modified and improved by Merino grades driven in from California, Oregon, and the East. In 1870 it was estimated that more than 80 percent of all the sheep in the United States were Merino or Merino grades.[41] By 1880 more than nine-tenths of the sheep in the Northwest approximated more or less closely to the Merino standard. At that time three-fourths of the sheep in Wyoming Territory were bred from the original Mexican ewes crossed with Merino and, to a less extent, Cotswold rams, and those in Montana Territory were a mixture of Merino, Cotswold, and Southdown, bred on the original stock.

The decrease in the number of sheep in various sections of the country and the decline in the price of wool, together with the rapid increase in urban population, better transportation facilities, and the development of the refrigerator car, caused a shift to mutton types to meet the growing demand for mutton. There was an appreciable increase in mutton rams in the range country of the Northwest immediately following the low wool prices that began in the middle eighties. The shift was especially rapid after 1893.[42]

[41] The early sheep in the Southwest and Pacific regions came from a combination of the degenerate mongrel coarse-wooled Mexican breed, a survival of early Spanish importations, to some extent with the later long-wooled common sheep of Spain and with some of what were later called the Spanish Merino. The flockmasters of these areas gradually improved their herd with Merinos, most of which were brought in from the older wool-growing sections of the United States. Connor, "Brief History of the Sheep Industry," 136–138; U. S. Census Office, Twelfth Census, 1900, *Agriculture*, 5 (1):cciі–cciv. The excellence of the Merino lay in the fineness of its wool, the weight of each individual fleece, the animal's ability to endure extreme cold, its unequaled docility and its ability to exist on the coarsest food. The Merino does not deteriorate easily, the offspring frequently surpassing the parent stock. *Ibid.*

[42] W. C. Barnes, "Corriedales and Other Types of Sheep for the Western Range," *Breeders Gazette*, 68:1245 (Dec. 30, 1915). From 1900 to 1910 the tendency to increase the mutton breeds was marked. In 1900, 30 percent of the flocks in the range country of the northwest were of the mutton type. By 1910, 60 percent of the rams and 30 percent of the ewes were of mutton breeds. E. A. Carman, H. A. Heath, and John Minto, *Special Report on the History and Present Condition of the Sheep Industry in the United States*, 87 (Washington, 1892).

The weight of wool clip per fleece in the United States increased from about 2 pounds in 1840 to 3 pounds in 1860 and by 1870 had reached an average of nearly 4 pounds. Although the average clip of the early herds in the Northwest was not high, it increased rapidly when emphasis was placed on Merinos. A Wyoming editor, describing activities in the Cheyenne region in 1881, said:[43]

> Mr. E. M. Post is quite an extensive sheep grower. His herd is made up of Mexican sheep which he is crossing with the Merino. The wool of the Mexican breeds is coarse and averages less than three pounds per fleece. The cross breeds shear on the average of three pounds each, the first year the wool being of a much better quality. The second year they will run from four to five pounds per fleece.

The average wool clip in the United States in the middle eighties was approximately 7 pounds per fleece. In 1900 Montana reported 4,348,568 fleeces and 30,437,829 pounds of wool, averaging about 7 pounds per fleece; Wyoming reported 3,390,571 fleeces averaging about 8 pounds; South Dakota averaged a little more than 6 pounds, while North Dakota averaged about 6½ pounds each.[44]

The great majority of the sheep were sheared once a year, usually in June. The shearing was ordinarily done without previous washing and dipping usually followed. At first extra men were employed for shearing, and they often received as much as eight to ten cents per fleece. As sheep ranching expanded in the Northwest, bands of shearers began to come in from New Mexico and Colorado and sheared for five cents and sometimes for as low as three cents per fleece.

> The shearers are a strange set, and every year are becoming more numerous. They cut a fleece with marvellous rapidity, and want little else than their food and clothing, with sometimes a pipe and glass of beverage after supper. They stroll in bands, hunting sheep to shear, and there appears to be a strange fascination about such a nomadic life. Sheep-shearing is now a regular business . . . and there are now men who do little else for a living.[45]

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[43] *Cheyenne Daily Leader*, Sept. 14, 1881. Cf. Brisbin, *Beef Bonanza*, 130–133.

[44] U. S. Census Office, Twelfth Census, 1900, *Agriculture*, 5 (1):679-683.

[45] Brisbin, *Beef Bonanza*, 120; *Cheyenne Daily Leader*, May 28, June 9, 14, 1870, June 24, 1880, July 23, 1881; *Turner County Herald*, May 12, June 30, 1887.

Wool prices, after slumping in the late sixties, advanced considerably during the next decade and then, except for a temporary rise in the early eighties, steadily declined until the end of the century. The average price per pound in the eastern markets for fine, medium, and coarse wool for the five-year period ending in 1875 was 51.6, 50.6, and 45.7 cents. For the ten years 1887–1897 the same grades averaged 26.1, 29.4, and 24.8 cents per pound, while from 1897 to 1907 the price averaged 30.5, 32.3, and 29.2 cents respectively.[46] In the late nineties the following observation was made: "There is as much optimism among sheep men as there was among the earlier cattlemen and wool prices make sellers happy."[47]

During the seventies much of the wool from the Northwest was shipped to eastern markets from Cheyenne, Wyoming. After the extension of the Northern Pacific Railroad through Montana many of the sheepmen of northern Wyoming trailed their sheep into Montana to avoid freighting the wool.[48] T. N. Howell and Son moved their flocks for this reason and by 1892 were running 10,000 head of sheep within easy freighting distance from Billings. By the end of the nineties Billings had become one of the largest wool markets in the west. In June 1899 the local paper was replete with announcements of the large wool clips being sold there. David Dockie from the Greybull River sold 50,000 pounds while the Newton Brothers, James F. Howell, Taylor and Hogg, and R. B. Heritage marketed shipments of from 20,000 to 35,000 pounds.[49]

Estimates of annual losses among range sheep where hay was kept for emergency feeding vary from 7 to 10 percent. The average annual loss among adult sheep during a term of years

[46] The greater part of the last increase in price was due to the Tariff of 1897, which followed three years of free wool under the Tariff of 1894. For the years 1894 to 1896 the price was 19.1, 21.1, and 19 cents. Other factors influencing the price were the increase in value of general farm products other than wool, better transportation facilities, and lower freight rates. Connor, "Brief History of the Sheep Industry," 144–148.

[47] *Billings Gazette*, June 30, 1899.

[48] *Rocky Mountain Husbandman*, Jan. 17, 1877.

[49] *Billings Gazette*, Apr. 14, 1892, and June issues of 1899.

was 9 percent and was caused chiefly by poisonous plants, predatory animals, snake bites, straying from the herd, occasional protracted droughts and unusually severe spring and winter storms. Scab was the most prevalent disease and caused a great deal of damage to both sheep and wool.[50] Grub in the head and dropsy were also sources of limited losses.[51]

The losses, however, were often heavy where the sheep were kept on an open-range basis and hay was not provided for emergency feeding. The winter of 1879–80 was the most severe experienced up to that time, and the losses from late spring storms when the sheep were in poor condition were large. More sheep were lost after March 15 than during the winter because of the lack of new grass. Losses were especially heavy among emigrant and diseased sheep. In Meagher County, Montana, where the open-range system was used to a considerable extent, they were estimated at as high as 80 percent, while Gallatin County where many sheepmen kept hay, reported only 10 percent.[52] A Black Hills editor, writing early in 1882, said: "Last winter's [1880–81] experience with sheep was not encouraging in the Black Hills area of Dakota and Wyoming. Deep snows, low temperatures and the lack of hay caused losses of more than twenty percent."[53] The winter of 1881–82, however, proved more disastrous to the sheep business than the previous one had been. Losses of as high as 50 percent were reported in certain parts of the Black Hills.[54]

Profits in sheep ranching, depending of course to some ex-

[50] Scab was brought in by trail sheep and was treated by dipping. H. F. Galen, a Montana sheep grower, drove 3,500 sheep to his ranch from Nevada in the fall of 1876. He leased 2,500 of them to the Smith Brothers on Crow Creek, whose experience with sheep was rather limited, and the herd took the scab. Out of a lamb crop of 1,200 almost 800 died and the whole flock produced only 7,000 pounds of wool. The flock was dipped in a solution of lye and tobacco which cured them. *Rocky Mountain Husbandman*, June 24, 1877.

[51] U. S. Census Office, Tenth Census, 1880, *Agriculture*, 3:1017; Buechel, *Commerce of Agriculture*, 388–389.

[52] *Helena Daily Herald*, Apr. 19, 1880; *Rocky Mountain Husbandman*, May 8, 1880.

[53] *Black Hills Weekly Pioneer*, Jan. 1, 1882.

[54] *Ibid.*, May 21, 1883; *Turner County Herald*, May 10, 1883.

tent upon the prices of mutton and wool, were rather high. Many ranchers and observers felt that sheep, if properly handled, with hay for winter use, would make more profit for the rancher than the same amount of money invested in cattle. The statements of annual profit vary from 25 to as high as 60 percent. R. B. Rumsey of Laramie Plains in Wyoming, reported a net profit of 35 percent for three years; E. M. Post of Cheyenne, Wyoming, reported a net profit of 60 percent for a year;[55] and Willard Clark of Clark & Company, located eighteen miles from Laramie City, Wyoming, stated that in three years he could clear a herd and ranch worth $12,000. While many of the reported profits were no doubt exaggerated, sheep ranching in the Northwest, located as it was close to cheap foundation stock, with possibilities of free range, gave good returns on the money invested.[56]

As a rule early sheep ranchers, often beginning with a small amount of cash, were careless about their buildings. A sheepman near Colorado Springs, Wyoming, stated in 1881, that he could start a suitable herd with range provided, for from $500 to $1,000. He would, of course, have to build his own stables, corrals, and ranch house.[57] An English traveler, writing in 1884, made the following observations regarding the general appearance of ranches:[58]

> The usual ranches are poor buildings, built like the Russians do their houses, of logs joggled at the ends, but here they are very inferior, and seldom have more

[55] Statements of net profits for a single year may be very misleading since losses and misfortunes the following year could greatly reduce the percentage. Profits averaged over a period of years give a more accurate picture of the business.

[56] W. H. Sutherlin, "Montana as an Agricultural Country," *Butte Daily Miner* (holiday ed.), Jan. 1, 1889; *Rocky Mountain Husbandman*, Apr. 6, 1876, Jan. 18, June 14, 1877; Brisbin, *Beef Bonanza*, 114–115; Shepherd, *Prairie Experiences*, 10. The average sheep ranch with a herd of 5,000 sheep had an outfit investment somewhat as follows: 640 acres of land at around $800; buildings and fences, $1,500; equipment in vehicles, harness, tools, etc., $750; horses and dogs, $750; and sundries, $200, making a total of $4,000. Add to that 5,000 sheep at $2.00 to $3.00 each and the investment amounts to from $14,000 to $18,000. In addition in most cases were several thousand acres of "free range."

[57] Brisbin, *Beef Bonanza*, 114–115.

[58] Shepherd, *Prairie Experiences*, 22.

than two rooms; even one room is common; the ready excuse for not improving his home is that it is temporary, though the man and his family may have occupied it for several years. The stable is a mere shed, the walls of thin poles badly put together.

The steady growth of sheep ranching and the final shift of emphasis from cattle to sheep in the Northwest did not occur without a struggle as keen feeling and prejudice between sheepmen and cattlemen existed from the start. As early as 1874 Joseph McCoy reported that conflict between the two groups was being waged in Colorado and Wyoming and that definite sides were being formed on the question as to whether or not the sheep or cattle industry should control the future of the West.[59] Cattle owners resisted the increasing number of sheep because of the gradual overcrowding of the range, and because they claimed that the sheep not only killed the grass on their own range but ruined the ranges over which they traveled. Cattle, it was said, were satisfied with cropping the grass to the crown, while sheep took the crown with the stock and left only the roots. What they did not eat they tramped down, often leaving the ground practically bare. Aside from the actual destruction of the range, sheep were accused of rendering the range valueless by an offensive odor which caused cattle to refuse to graze or drink on ranges crossed by sheep. Such were the grievances real or fancied of the cattlemen against the flockmasters.[60]

Since the "free range" belonged to the Government, the sheep owners felt that they had as much right to use it as the cattlemen and accordingly grazed their flocks over wide areas, paying little attention to ranges claimed by cattlemen because of priority rights and custom. Eastern Wyoming suffered especially from these "loafer flocks" as they were sometimes called. While each considered the other the aggressor, it was usually the cattle-

[59] Joseph McCoy, *Historic Sketches of the Cattle Trade of the West and the Southwest*, 379 (Kansas City, 1874).

[60] *Wyoming Industrial Journal*, November 1900; Grace Lillian Marner, "The Range and Ranch Business in Wyoming, 1870–1890," 40–45 (MS., M. A. Thesis, University of Iowa, 1922); Felter, "Beginnings of the Range and Ranch Business in Montana," *passim*; Steinel, *History of Agriculture in Colorado*, 147–150.

man who took the initiative in attempting to eliminate or at least restrict the activities of the sheepman, whom he considered an intruder. As a rule both cattle and sheep associations deprecated strife and at various annual meetings constant references were made to the subject, cattlemen insisting that raids on sheep camps were made on individual responsibility and against the counsel of the organization.[61] Public sentiment on the ranges of the Northwest in the early years was prejudiced against the sheep owner and strongly in favor of the cattleman. While this feeling was not always openly expressed, there invariably occurred an undercurrent of covert antagonism against the sheepman, accompanied by a feeling of sympathy for the aggressors.

Edward W. Smith of Evanston, Wyoming, giving testimony before the Public Lands Commission in behalf of the cattlemen, said:[62]

> Cattle and sheep ranges are held by suffrage and custom. There is now a law of the territory which prevents trespassing upon occupied ranges near settlements, but away from the settlements the shot-gun is the only law, and the sheep and cattle men are engaged in a constant warfare. The sheep men are generally the aggressors. Their sheep destroy the grasses, and the cattle will not again graze on the land. If the stock owners could obtain absolute control of their ranges under United States laws, the value of the herds, both cattle and sheep, would be materially increased . . . and peace and quiet would supersede the present turmoil.

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[61] Early organizations of ranchmen in the Northwest made no distinction between cattle and sheep growers, admitting both to membership. As antagonism developed between the two groups, the sheepmen withdrew and formed organizations of their own. The Montana Wool Growers' Association was organized in September 1877, while meetings of sheepmen are recorded in Wyoming in the eighties. Dakota sheepmen apparently had no association of their own, but were often members and attended meetings in the other two areas. County sheep associations were quite common in Wyoming and were active. *Helena Daily Herald*, Sept. 19, 1877; *Rocky Mountain Husbandman*, Sept. 24, 1877; *Cheyenne Daily Leader*, Sept. 24, 1880, June 13, 1882; *Black Hills Daily Pioneer* (Deadwood), Jan. 1, 1882, Mar. 17, 1884; R. E. Strahorn, *The Handbook of Wyoming and Guide to the Black Hills and Big Horn Regions*, 27–35 (Cheyenne, 1877); *Members and By-laws of the Wyoming Stock Growers Association*, 1887.

[62] "Report of the Public Lands Commission," U. S. Congress, 46, 2 Sess., *House Executive Document 46*, p. 548–550, 554, 641. Edward W. Smith was a member of the firm Beckwith, Gwynn & Co., who were bankers, merchants, and cattle dealers of long standing at Evanston, Wyoming.

A. T. Babbitt, testifying before the same group, added: "Cattle men respect one another's claims and rights. Sheep men are aggressive, and drive cattle men back."

One writer quoted a cattleman whose testimony is expressive of the keen feeling against sheep ranchers:[63]

> The sheep herder is the worst blot on the state. He is no good and does much harm. . . He fits out his wagon with a Mexican and a dog and several thousand sheep and away they go like an Egyptian scourge, eating the grass down to the ground and in sandy soils tramping it down so there are great regions where bunch grass once grew knee high, but where the country is now bare as a desert.

The Commissioner of the General Land Office reported in 1898 that "Next to fires, sheep grazing constitutes the most serious difficulty to be considered in administering certain of the reserves."[64]

In the eighties and nineties there occurred in Wyoming a series of struggles between sheep and cattle men, often so prolonged and bloody as practically to constitute "range wars." Attacks on herds of sheep were numerous and were often made against flocks in charge of Mexican herders. Thousands of sheep were poisoned, clubbed to death, or had their throats cut. Flocks were driven over cliffs, and on various occasions large herds were driven from southern Wyoming into Colorado. The herders were held while the sheep were killed and were warned not to return. Groups of cattlemen sent out armed scouts to locate the sheep camps. The sheepmen recruited forces to combat them but were usually overcome. Herders were often bound to trees while their sheep were killed and many of the trails leading from Wyoming were strewn with carcasses of dead sheep.[65] The struggle not only meant loss of animals but often involved the loss of human lives. One reliable writer stated

[63] Ralph Julian, *Our Great West*, 368–370 (New York, 1893).

[64] U. S. General Land Office, *Annual Report*, 1898, p. 87.

[65] Clara M. Love, "History of the Cattle Industry in the Southwest," *Southwestern Historical Quarterly*, 20:12–15 (July 1916); Steinel, *History of Agriculture in Colorado*, 147–150; *Cheyenne Daily Leader*, 1885–1900; "Cattle Graziers on Public Lands," in U. S. Congress, 50, 1 Sess., *House Executive Document 232*. Personal interview with Oscar Evans, sheep rancher of Rock Springs, Wyoming, July 17, 1935.

that in the years from 1893 to 1903 three scores of men were killed and five times that number were wounded in the conflict that extended pretty well over the entire State.[66] "Despised and rejected of men" might well be applied to the flockmasters of Wyoming as far as the cattlemen were concerned.

In Montana adjustments between the cattlemen and sheepmen were made without a serious struggle due to the fact that the cattlemen had never occupied as prominent a position there as in Wyoming. The mining and agricultural interests were far too strong to allow such domination and second, the presence of newly opened Indian country in northern and eastern Montana, made it possible for the open range to continue for some time undisturbed by the small farmer and rancher. By 1902 an attempt was made by the Montana Stock Growers' Association to move its headquarters from Miles City in eastern Montana to Helena in the western portion of the State on the grounds that sheepmen were taking over many of the ranges of eastern Montana. The Association decided by a close vote to continue its meetings in the eastern portion of the State.[67] While the number of sheep had increased rapidly in the Black Hills area of Dakota in the eighties and nineties the sheepman was never enough of a competitor with the cattle operator to cause serious trouble.

In the Northwest during the late nineties the passing of the large-scale cattle operator was accompanied by a rapid increase in the number of small ranchers, granger farmers, and sheepmen. The small-scale cattleman was often a farmer who had curtailed his agricultural activities to go into the cattle business. The Governor of Wyoming in 1905 recognized the change which was by that time complete in that State: "Today our cattle are owned by 5,000 different stockmen and farmers, instead of by a few hundred large range outfits."[68] The increase in the number

[66] Love, "Cattle Industry in the Southwest," 15–16.

[67] Osgood, *Day of the Cattleman*, 255; *Stockgrowers Journal* (Miles City), Apr. 17, 1902.

[68] Wyoming, Governor, *Message of Bryant B. Brooks . . . to the Eighth State Legislature*, 1905, p. 3.

of cattle and sheepmen during this period necessitated the eventual adjustment of differences between the two groups. The process of adjustment was much more difficult in Wyoming than in Montana and the Dakotas and was accompanied by a second period of conflict and bloodshed.

In the spring of 1901, the cattlemen of the Upper Shoshone River Valley in Wyoming organized a "Stockmen's Protective Association" and discussed the matter of dividing the range between the cattle and sheep interests. The general opinion seemed to favor division of the territory with the establishment of a "dead line" over which sheepmen should not be allowed to come. Threats were made at the time by both sides but no serious outbreak occurred. For the next two years the smoldering fires of hard feeling were restrained although there was danger of a serious outbreak at any moment.[69] Early in 1903 the possibility of the President of the United States appointing a special committee to investigate and to determine the respective rights of the two groups was widely discussed.[70]

Early in February 1903, a band of men, armed and masked, attacked a large sheep camp in the Big Horn Valley. They killed or scattered the sheep and murdered the herders. This was the signal for the outbreak of a "range war" in Wyoming which lasted for nearly six years.[71] While the struggle was quite general throughout the grazing area, the conflict was keenest in the eastern and north-central portions of the State. Bands of masked and armed horsemen terrorized various areas, shooting owners of flocks and their herds without warning. Sheep camps were burned and herds were dynamited or rimrocked.[72]

[69] *Wyoming Industrial Journal*, June 1901.

[70] *Dakota Republican*, Jan. 13, 1903; *Thermopolis Record*, Jan. 23, 1903.

[71] The controversy between cattle and sheep men attracted considerable attention and was discussed in current periodicals. For example, see R. S. Baker, "The Tragedy of the Range," *Century Magazine*, 64:535–545 (August 1902); Charles Michelson, "War for the Range," *Munsey's Magazine*, 28:380–382 (December 1902); E. P. Snow, "Sheepmen and Cattlemen," *Outlook*, 73:839–840 (Apr. 4, 1903).

[72] Charles Lindsay, "The Big Horn Basin," 232–233 (MS., Ph.D. Thesis, University of Nebraska, 1930); Marner, "Range and Ranch Business in Wyoming," 45–50; *Dakota Republican*, Feb. 17, 1903; *Thermopolis Record*, Feb. 6, 13, Mar. 11, 1903, June 4, 11, 25, 1904.

The climax of the struggle came when the sheep industry was at its peak. In 1909, Wyoming was estimated to produce more wool and mutton than any other State in the Union.[73]

In April 1909, a camp containing 5,000 sheep, located on Spring Creek in the Big Horn Basin, and owned by two wealthy sheepmen, Joseph Emge and Joseph Allemand, who had been warned to stay out of the valley, was attacked after nightfall by about twenty armed men wearing masks. The owners of the herd and one herder were killed before they could surrender, the camp wagons were burned, and the sheep slaughtered. The affair caused much excitement and the National Wool Growers' Association said it was ready to subscribe $20,000 to back a prosecution. Several county associations offered $1,000 each.[74]

A grand jury took testimony and was in the process of deliberation when one of the witnesses committed suicide, leaving several letters which implicated a number of prominent cattlemen in the attack. Seven arrests were made early in May, one of the men being George Sabin, owner of the Bay State Ranch. After two of the suspects turned State's evidence, the other five accused pleaded guilty and were sentenced to from three years to life. This affair, promptly and ably handled by the civil authorities, had a wholesome effect upon the range struggle. It showed that public sentiment was on the side of law and order and that crimes committed on the public range would be punished. After 1909 range difficulties in Wyoming rarely assumed serious proportions.[75]

HAROLD E. BRIGGS

University of Miami
Coral Gables, Florida

[73] *Wyoming Industrial Journal*, October 1909.

[74] *Ibid.*, May 1909; *Big Horn County Rustler*, Apr. 9, 16, 30, 1909; Lindsay, "Big Horn Basin," 233.

[75] *Big Horn County Rustler*, May 7, 13, 27, 1909; *Denver Republican*, Nov. 13, 1909; *Wyoming Industrial Journal*, November 1909, June 1910; Lindsay, "Big Horn Basin," 233-234.

AGRICULTURE IN CUBA DURING THE SECOND UNITED STATES INTERVENTION, 1906–1909

The United States governed the Republic of Cuba from September 29, 1906 to January 28, 1909. During this period of depression and crisis, Charles E. Magoon, an American governor, decreed and enforced laws, collected taxes, supervised an extensive program of public works, and promoted agriculture. Since the prosperity of Cuba depends almost entirely on its agriculture, the activities of the Provisional Government dealing with this industry merit special attention.

Cuba has an abundance of arable land and is blessed with a climate which permits the growing of a wide variety of crops.[1] Most fruits and vegetables can be grown with little effort. The soils suitable for agriculture are unusually rich and may be divided into four groups: the red cane lands, the black cane and grass lands, the sandy tobacco lands, and the prairies. The first three produce the principal crops of Cuba, sugar cane and tobacco. In addition, vegetables, citrus fruits, pineapples, coconuts, cacao, coffee, textile plants, wheat, rice, corn, and medicinal plants are cultivated. The prairies furnish excellent pastures for stockraising and that industry has always ranked high. Poultry and bees are important, and the natural wealth of the island is increased by the fish, turtles, and sponges which abound in surrounding waters. In 1907 forests covered 1,226,454 acres. Although there had been widespread vandalism, sufficient timber remained to meet the demands of domestic and foreign markets.[2]

[1] Gonzalo de Quesada, *Cuba*, 65–112 (Washington, 1905). This work contains valuable data on topography, climatology, flora, fauna, agriculture, and industries. It was sponsored by the International Bureau of the American Republics.

[2] Victor H. Olmsted and Henry Gannett, compilers, *Cuba: Population, History and Resources, 1907*, p. 14–24 (Washington, 1909). This work is similar to that of Gonzalo de Quesada, but it includes additional data from the Cuban census reports of 1907. See also F. S. Earle, "Agricultural Cuba," *World To-Day*, 11:1177 (November 1906).

Although Cuban agriculture has been blessed by Nature, it has also suffered at her hands. Occasionally tropical hurricanes and storms destroy crops, trees, buildings, and human life, and floods and droughts are not unknown. Of most significance, however, is the rainfall. In the dry season from October to April tobacco is planted and harvested, sugar cane is cut and most of the sugar marketed, fruit products ripen and are marketed, and vegetables are grown, especially for United States markets. The season is a busy one for the planters and small farmers, and there is a heavy demand for laborers. During the wet season which lasts from April through September agriculture is at a standstill and thousands of field hands are unemployed. Unable to support themselves and their families until the next growing season, they frequently become charges on the country and ready followers of radical politicians and revolutionary leaders. This annual unemployment problem, produced in part by the weather and by overemphasis on the production of sugar, is one from which Cuba still suffers.

In the fall of 1906 Cuban agriculture was subjected to a series of destructive and disturbing forces from which it did not recover until the end of Governor Magoon's administration. First came the August Revolution of 1906 which overthrew the Estrada Palma Government and occasioned American intervention. This revolt upset the economic balance of the island, and it was attended with the destruction of crops and the theft of horses and cattle.[3] During the same year Cuba suffered from a serious drought. The rainfall of the wet season was little in excess of the amount that usually falls during the dry season, and during the latter period "there was little if any rain."[4] The excess value of sugar and allied industries was over five million dollars less in 1906 than in the preceding year.[5] The

[3] Irene A. Wright, *Cuba*, 173–193 (New York, 1910); Enrique Collazo, *La Revolución de Agosto de 1906, passim* (Habana, 1907).

[4] Cuba, Provisional Governor, 1906—(Charles E. Magoon), *Report of Provisional Administration from October 13th, 1906 to December 1st, 1907*, p. 37 (Havana, 1908). Hereafter, cited as Magoon, *Report 1*.

[5] Olmsted and Gannett, *Cuba*, 71.

tobacco and vegetable crops were reduced, but they brought top prices because of their scarcity. Many crops were ruined, trees were destroyed, and several lives were lost in a violent cyclone that passed through the island on October 17, 1906. Estimates of the damage ran into millions of dollars.[6] These misfortunes served to check credit and the panic of 1907 in the United States was preceded by general liquidation in Cuba. Finally, agriculture suffered because of political unrest occasioned by proposals of annexation, pending elections, and the rumored withdrawal of the Provisional Government from the island.

The Magoon administration lost no time in giving aid to agriculture. This aid consisted of direct relief, construction of rural roads and bridges, encouragement of diversified crops and all-year industries, and promotion of scientific farming. The agricultural program was not an isolated one, but part of a general emergency plan designed by United States officials to restore peace, order, and prosperity in Cuba.

The first major task completed by the Provisional Government and one which involved direct relief was the disbandment of the rebel forces and the national militia. This gave the island peace and returned laborers to their homes and farms. To prevent the insurgents from living off the country on their way home the Government issued rations for the men and horses,[7] and arranged to pay for the horses that had been stolen during the revolt.[8] As many of the soldiers were without work or supplies when they reached home the Government was confronted with the problem of distributing food or providing jobs. It

[6] *Havana Post*, Oct. 20, 1906.

[7] "Report of William H. Taft, Secretary of War, and Robert Bacon, Assistant Secretary of State, of What Was Done under the Instructions of the President in Restoring Peace in Cuba," U. S. War Department, *Annual Reports* (1906) 1:530 (Washington, 1906).

[8] Wright, *Cuba*, 184–185. The rebels were really supposed to turn in all property unlawfully taken for military purposes. However, a mistake in the Spanish certificates vested title to the stolen horses in the holders and accordingly the Government agreed to compensate the real owners.

chose the latter alternative and soon hundreds of idle field hands were busily engaged in building roads and bridges.[9]

However, jobs for the laborers did not rescue the large planters and lesser farmers. Many of these men had heavy investments, but because of the prevailing hard times, they could not get enough money to meet their obligations or to harvest and market their crops. To aid this group the Provisional Governor issued a decree on November 11, 1907, which authorized the Government to loan $5,000,000 to various banks in Cuba on the condition that they extend needed credit to the planters and farmers. The banks that secured these loans were required to deposit approved collateral security with the national treasury, and the Government reserved the right to recall the loans should the money be used for undesignated purposes.[10] At this time the Government was well able to spare the money. The decree not only provided credit for agriculture during the depression, but it did much to win confidence in the Government and was approved throughout Cuba.[11]

During the second intervention the Provisional Government received aid and advice from an unofficial body called the Advisory Commission of Agriculturists. This commission had its origin in an association of sugar planters known as the Agricultural League. Soon after the United States took charge in Cuba the League requested the Provisional Governor to select members from their organization to serve on a commission which would, after a careful study, make recommendations concerning their industry. The request was granted and the membership was enlarged to include representatives of the tobacco industry. The following were named: Rafael F. de Castro (president),

[9] A striking comparison can be drawn between the emergency measures used in Cuba during the second intervention and those recently inaugurated by the New Deal in the United States.

[10] See no. 1085 of the Decrees of 1907 in *Republic of Cuba under the Provisional Government of the United States, Decrees, 1906–1909* (Havana).

[11] Magoon, *Report 1*, 63; *Havana Post*, Nov. 7, 1907, advocated government aid for agriculture, and *La Lucha* (Habana), Nov. 12, 1907, hailed the loan as a great boon to agriculture.

Gabriel Casuso, Manuel Froilán Cuervo, Leopoldo Sola, Eduardo Dolz y Arango, Claudio G. de Mendoza, Luis S. Galbán, José María Espinosa, Luis Marx, Lorenzo D. Beci, Juan María Cabada, Roberto B. Hawley, Miguel Machado, and Gabriel Camps. This body made many practical suggestions concerning the two chief crops of the island, and it is worthy of note that these men served without pay even after "being informed that the Government felt that they were entitled to compensation . . ."[12]

Agriculture also received attention from the Department of Agriculture, Industry, and Commerce. Its acting-secretary, Francisco I. Vildosola, with his small force of one hundred thirty-four employees, rendered efficient service. They supervised the weather stations, fisheries, forests, mines, vaccines and brands for cattle, experiment stations, colonization and immigration, and agricultural statistics, and published and distributed agricultural circulars and a monthly bulletin.[13]

Mention has been made of Governor Magoon's road-building program. It not only gave work to the unemployed, but it revolutionized Cuban agriculture by speeding up transportation and communication, opening new areas for cultivation, and making markets more accessible. When the Provisional Government was established, Cuba had less than five hundred miles of macadamized roads.[14] The lack of improved roads and bridges made it difficult to get such products as sugar, tobacco, timber, fruits, and vegetables to market. The small farmers suffered most, as many of the large sugar estates had private railroads connecting with the main lines or with seaports.

In some sections of the island, notably in Oriente, whole districts were uncultivated and nearly depopulated because of the difficulty and expense of transporting farm products to market. Many so-called roads were merely right of ways which could only be used with difficulty during the dry season. Bridges were often entirely lacking or unfit for heavy traffic because of long

[12] Magoon, *Report 1*, 60.
[13] *Ibid.*, 403–452.
[14] *Ibid.*, 48.

usage and few repairs. It frequently required ten oxen to do the work of a good team of mules, and days were taken for trips that should have been completed in a few hours.[15]

The Provisional administration spent over thirteen million dollars for the construction and repair of roads and bridges from October 1, 1906 to September 30, 1908.[16] It would be difficult to estimate the value of this work to the entire population and to the farmers and planters in particular. Only those who can visualize the tremendous social and economic benefits derived through improved means of transportation and communication by a people almost isolated can appreciate the significance of the road program. One road built in Matanzas reduced the cost of getting sugar to port from ninety to fifty cents a bag. "The road from Pinar del Rio to Viñales and Esperanza reduced the price of passenger transportation from $15.00 to $1.50 and the time of trip from three days to less than three hours."[17] Such savings in time and money were typical of effects throughout the island.

The cattle industry also received aid from the Provisional Government. During its war for independence Cuba was practically denuded of cattle, and to restore this industry laws had been passed which prohibited the exportation and killing of cows and heifers. A low tariff had also been adopted to promote the importation of cattle. During the second intervention, cattle raisers suffered not only from the general depression but from the importation of cheap range cattle from the United States and South America. They petitioned for the repeal of the restrictions on exportation and slaughtering and requested a high tariff to bar foreign competition. Governor Magoon, after ascertaining that the supply of domestic cattle was sufficient to

[15] *Ibid.*, 366; W. A. DuPuy, "Road Building by the United States in Cuba," *Scientific American*, 100:136–137 (Feb. 13, 1909).

[16] Cuba, Provisional Governor, 1906–1909—(Charles E. Magoon), *Report of Provisional Administration from December 1st, 1907 to December 1st, 1908*, p. 30 (Havana, 1909). Hereafter, cited as Magoon, *Report 2*.

[17] *Ibid.*, 35; Irene A. Wright, "The Cart-Roads of Mister Magoon," *World To-Day*, 16:641–648 (June 1909).

supply the needs of the people, complied with the requests of the cattle raisers. Decrees were issued permitting exportation and the killing of cows and heifers, and a protective tariff was imposed on the importation of beef cattle.[18] This action served the double purpose of raising the price of cattle and of giving stock raisers confidence in the future.

Cubans generally and farmers in particular were interested in the new game law which was promulgated by the Provisional Governor on January 18, 1909. It declared that all wild animals were the property of the State and gave the Government authority to regulate all forms of hunting. It guaranteed the ownership of tame and domestic animals as long as they remained under the dominion of the owner. Songbirds, woodpeckers, swallows, vultures, and other birds that were regarded as helpful to man were protected against destruction. An open season was allowed on animals, birds, and reptiles considered injurious to man.[19] The new law recognized the right of the State to conserve and regulate the natural resources and showed that the Government realized the important part which animals, birds, reptiles, and insects play in the everyday life of man. This greatly needed law replaced an obsolete law of Spain which had been extended to Cuba without change in 1884.[20]

As the Magoon administration drew to a close Cuban agriculture, generally speaking, was in a fairly prosperous condition. The country was recovering from the Revolution of 1906 and the panic of 1907. There were no cyclones of any consequence and the rainfall was adequate for normal production. Government loans to planters and farmers had prevented many foreclosures, and the improved road system enabled farmers to get their products to market more rapidly and at greatly reduced costs. Agriculture was also benefited by river and harbor improvements and increased railroad mileage.[21] That it was defi-

[18] Magoon, *Report 2*, 16–19; *Decrees 1908*, no. 86.

[19] *Decrees 1908*, no. 67.

[20] *Official Gazette* (Havana), Jan. 22, 1909.

[21] Ramiro Guerra y Sánchez, *Un Cuarto de Siglo de Evolución Cubana, passim* (Habana, 1924).

nitely improving is indicated by the fact that the agricultural exports in 1907 exceeded those of 1906 by approximately $6,000,000 and were higher than those of any previous year by more than $2,500,000.[22]

Although the Provisional Government did much directly and indirectly for Cuban agriculture, it failed, as have its successors, to remedy the evils of seasonal unemployment, low wages and low prices in the agricultural industries, absentee ownership, and the high cost of living. However, the United States could hardly reform the economic system of Cuba in twenty-eight months. Any evaluation of the Provisional Government's agricultural policies must make allowances for the abnormal conditions and the temporary and emergency nature of the Government itself. The aid given to agriculture was only part of a general program of reform and improvement, and when the agricultural conditions of January 1909 are compared with those during the fall of 1906, it is apparent that Cuban agriculture was well administered during the second United States intervention.

DAVID A. LOCKMILLER
Department of History and Political Science
North Carolina State College of Agriculture and Engineering
University of North Carolina
Raleigh, North Carolina.

[22] Olmsted and Gannett, *Cuba*, 88.

ANIMAL HUSBANDRY IN EIGHTEENTH CENTURY ENGLAND

PART 2

SHEEP, SWINE, HORSES, AND POULTRY

The sheep was ubiquitous in eighteenth century England. It was prized by the open-field farmer for its "fold" and by the breeder of the open grazing lands for its wool. Only later in the century did its meat come to be greatly regarded, although the number sold annually in Smithfield rose from half a million at the beginning of the century to three quarters of a million at the end.[1] Ernle clearly defined the position of sheep breeding in the early years of the century, and has given us, in a general way, his impressions of the improvements effected by such men as Robert Bakewell and John Ellman and their imitators, while we have published our impressions of the sheep population and its produce in another place.[2] So far as the actual number of sheep in the country is concerned, the estimates of eleven million in 1696, sixteen and a half million in 1741, and twenty-six million in 1803, provided respectively by Gregory King, Jonas Webb, and John Luccock, are not incompatible with probability, but there is no valid evidence to supply an average carcass weight or fleece.

A general classification of the breeds and their qualities at the beginning of the eighteenth century, prefaced by a little advice, is supplied by the anonymous A. S., Gent.:[3]

[1] Select Committee of the House of Commons, appointed to [consider] . . . the cultivation and improvement of the waste, uninclosed and unproductive lands of the kingdom, . . . The first report of the, 1796, Appendix A.

[2] Ernle, *English Farming, Past and Present*, 177–179, 186–187 (ed. 5, London, 1936); G. E. Fussell and Constance Goodman, "Eighteenth Century Estimates of British Sheep and Wool Production," *Agricultural History*, 4:131–151 (October 1930).

[3] A. S., Gent., *The Husbandman, Farmer and Grazier's Compleat Instructor*, 55–56 (London, 1697).

Of *Sheep* there are sundry breeds, according to the countries they are bred in, and the Pasture they feed on; the rich Champion Country produced a large breed; and the barren and cliffy, those of reasonable stature; The wild and mountainous Ground a small and wearish Sheep; and the best way to have Success and Profit in dealing in them, is to procure a good, sound, healthy Breed. . .

In *Herefore-shire*, especially about *Leominster*; and on those famous Hills, called *Cotswold-Hills*, Sheep are fed that produces a singular good Wooll, which for fineness comes very near to that of Spain, for from it a thread may be drawn as fine as Silk. And they are much the same in *Worcestershire*, tho' they are black Fac'd, small Bon'd, and bear but a little burthen.

Buckingham-shire, *Warwick-shire*, *Northampton-shire* and *Leicester-shire* produce Sheep of a large Bone and good Shape, like wise the deepest staple.

Lincoln-shire, especially in the Salt Marshes and Fenny Grounds produces the largest *Sheep*, but not the best Wooll, for their legs and Bellies, tho' long, are for the most part bare or naked.

York, and Northwards, to the Borders of *Scotland*, produces lusty *Sheep*, of big Bone; but then their Wooll is not so advantageous, as being rough and hairy.

In *Wales*, for the most part, the *Sheep* are small, and their Wooll little, but are the sweetest Mutton.

There are an excellent Breed of Sheep produced on *Banstead Downs*, in Surrey.

Kent, especially in Rumny Marsh, produces abundance of Sheep, but the beginners of them were brought out of other countries to raise the stock; however the Feed much increases them in Flesh and Wooll: And, indeed, *England* for the goodness of its Sheep, is able to vye with any Nation under Heaven.

This classification seems to have been recognized as at least approximately correct, for it was, with slight variations, repeated by a number of writers up to the end of the third quarter of the century.[4] The growing importance of mutton, however, induced John Mills to state the districts from which the finest and sweetest was produced in 1767, and these districts were the Peak, Wiltshire, Hampshire, Dorset, Banstead, and similar upland countries.[5] Ernle has to some extent disposed of the variation of breeds by dividing the sheep into longwool and shortwool,

[4] [John Mortimer], *The Whole Art of Husbandry; or, The Way of Managing and Improving Land*, 177 (London, 1707); Richard Bradley, *A General Treatise of Husbandry and Gardening*, 160 ff. (London, 1726); William Ellis, *The Modern Husbandman*, 2:134–136, June (London, 1750); Thomas Hale, *A Compleat Body of Husbandry*, 219–220 (London, 1756); Robert Brown, of Somersetshire, *The Compleat Farmer: or, The Whole Art of Husbandry*, 31–32 (London, 1759); [John Ball], *The Farmer's Compleat Guide through all the Articles of His Profession*, 404 ff. (London, 1760); John Mills, *A Treatise on Cattle*, 329 (London, 1776); Cuthbert Clarke, *The True Theory and Practice of Husbandry*, 117–124 (London, 1777).

[5] John Mills, *A New and Complete System of Practical Husbandry*, 3:179 (London, 1767).

but naturally he stresses the importance of the numerous variations in the experiments and improvements of Bakewell's disciples. Many of contemporary writers on the subject were in the habit of calling the sheep in each county by its name, and so multiplying breeds, but Luccock, who was, perhaps, the most accurately informed of the later specialists on the subject, did not consider it necessary to do this. He divided the sheep of the country into thirteen breeds, six longwool and seven shortwool, as follows: longwool,—Teeswater, Lincoln, Leicester, Kent and Romney Marsh, Devon, and Cotswold; shortwool,—Norfolk, Southdown, Wiltshire, Western, Hereford, Heath, and Welsh.[6]

The elaboration of these somewhat general classifications is instructive as there was some disagreement concerning the breeds it was desirable to separate by name.[7] The good quality of the mutton provided by the small sheep of Banstead Downs and Bagshot Heath has already been mentioned; it was so esteemed that Richard Bradley used it for the purpose of comparison as early as 1727.[8] Romney Marsh was always the great center of sheep grazing in Kent, and the lambs were kept at joist in winter on stubbles and leys in the neighborhood of Maidstone and other upland of the county. In this district also some Wiltshire and Southdown wethers were kept for fatting, and some of these were fed on oil cake. At the end of the century, the Isle of Thanet had small feeding flocks of sheep which were smaller than the Southdown in size. In the Marsh the sheep were, to Marshall's eyes, descended from the same race as those of the South Hams of Devon, the ancient stock of the wild lands, large and longwooled, and they needed improving. Dorset sheep were kept in the Petworth district to produce early grass lamb. West Downs were kept on the coast of Sussex, and on the Isle of Wight, where the central range of hills made sheep breeding profitable, the breeds were Hampshire and Southdown crossed with Dorset

[6] John Luccock, *The Nature and Properties of Wool . . . with a Description of the English Fleece*, 338, table 1 (Leeds, 1805).

[7] Arthur Young, *Annals of Agriculture and Other Useful Arts*, 6:422 (Bury-St. Edmunds, 1786).

[8] Richard Bradley, *A Complete Body of Husbandry*, 186 (London, 1727).

ewes.[9] On the chalk downs of Hampshire the Southdown had become popular by 1798.[10] The original Hampshire horned sheep was, however, the main stock, and both this and the native Wiltshire had been occasionally crossed with the New Leicester after the turn of the century. The number of the flocks here was said to have been reduced by one third owing to the breaking up of the downs and the inclosures.[11]

The four Western counties were always well-known grazing areas, and Dorset particularly so, the number of sheep grazed in this county being estimated by Daniel Defoe at six hundred thousand, and this or higher figures being quoted throughout the century. By 1793 the original breed "whose flesh is very delicate and sweet, and wool so fine that it is much coveted by clothiers" was not to be met with, as so many crossing experiments had been made with Hampshire, Wiltshire, and Somerset sheep.[12] There were a good many Southdowns in the north of the county in 1812, and Merinos had made some progress there by that date. The sheep on the Isle of Portland and on the moors in the south-east of the county were still very small.[13] Dartmoor and Exmoor in Devon were also famous sheep feeding moors, the former being said to provide summer grazing for one hundred thousand in 1768.[14] There were only two houses on the moor in 1800.[15] The

[9] William Marshall, *The Rural Economy of the Southern Counties*, 1:325–327, 378; 2:35, 199, 241, 284 (London, 1798); Young, *Annals of Agriculture*, 2:93 (1784), 19:75 (1793), 32:32–35 (1798); John Hassell, *Tour of the Isle of Wight*, 1:124 (London, 1790); Thomas Pennant, *A Journey from London to the Isle of Wight*, 2:14, 153 (London, 1801); William Gilpin, *Observations on the Coasts of Hampshire . . . in 1774*, p. 41, 66 (London, 1804).

[10] Marshall, *Rural Economy of the Southern Counties*, 2:371.

[11] Abraham and William Driver, *General View of the Agriculture of the County of Hants*, 23 (London, 1794); Charles Vancouver, *General View of the Agriculture of Hampshire, including the Isle of Wight*, 365–370 (London, 1813).

[12] Theophilus Botanista, *Rural Beauties*, 201 (London, 1757); *Rural Elegance Display'd*, 201 (London, 1768).

[13] John Claridge, *General View of the Agriculture in the County of Dorset*, 10–11 (London, 1793); William Stevenson, *General View of the Agriculture of the County of Dorset*, 395–413 (London, 1812).

[14] *Rural Elegance Display'd*, 180; cf. William Marshall, *The Rural Economy of the West of England*, 2:15 (1796); Young, *Annals of Agriculture*, 17:564 ff. (1792), 29:200, 316, etc. (1797).

[15] Martin Dunsford, *Miscellaneous Observations in the Course of Two Tours . . . West of England*, 30 (1800).

sheep here were fairly miscellaneous by the end of the century. In the South Hams they were large, the knots of the moor not being considered good. An attempt had been made to introduce the New Leicesters, and there were some Dorset Horns. The moor sheep were notts (or polled) and like small Dorsets, and the Exmoor sheep were of moderate size.[16] As early as 1721 it could be said that the Cornish sheep had been much improved since the manuring of the county. Formerly they had been small and their wool coarse, but by that date they equalled their neighbors both in size and wool and were much sweeter meat. The wool had been known as Cornish hair. The sheep were hornless with very sweet flesh and had small fine fleeces in 1757.[17] By the end of the century they were said to be the same as the Devons and to have been much improved by crosses. One gentleman had brought New Leicesters even to this remote county. The old breed even then remained on the wastes and mountains, and there were flocks of goats and kids seen at St. Mervan's in 1808.[18] Sheep were kept all over Somerset, but the breeds were like those of the neighboring counties. In the northeast a large and good race was found, and in the Mendips a small but sweet-fleshed animal; Dorsets and Exmoors were present in the districts abutting on those counties.[19] The sheep stock were the basis of the Wiltshire Down husbandry, and in north Wiltshire many sheep were bred. The number folded, however, was supposed to have decreased by the end of the century. Thomas Davis, the author of both County Reports, thought that the decrease in the number of sheep bred in many parts of the Kingdom and the vast increase in the consumption of mutton

[16] Robert Fraser, *General View of the County of Devon*, 33–34, 53 (London, 1794); Charles Vancouver, *General View of the Agriculture of the County of Devon*, 218, 342–352 (London, 1808).

[17] *A New General Atlas*, 185 (1721); Botanista, *Rural Beauties*, 16; cf. *Rural Elegance Display'd*, 16.

[18] Robert Fraser, *General View of the County of Cornwall*, 46–47 (London, 1794); G. B. Worgan, *General View of the County of Cornwall*, 148–151 (London, 1811); Young, *Annals of Agriculture*, 29:559 (1797); R. Warner, *Tour through Cornwall*, 103 (London, 1809).

[19] John Billingsley, *General View of the Agriculture in the County of Somerset*, 106 (London, 1794); *ibid.*, 145, 254–255, 292–293 (Bath, 1798); Author of the Tour in Ireland, *Journal of a Tour to the Western Counties*, 25 (1809).

seemed a paradox which could only be accounted for by assuming that the animal was killed at an earlier age. Some years before they had been slaughtered at four, five, and six years of age; later three fourths of them were killed at or before they were two. The stock was the Wiltshire horned sheep, although there had been some attempts to introduce the Southdown.[20] In the Cotswold Hills of Gloucester, the sheep were longwooled, middle-sized, and were fatted at two shear or three years old. At the end of the century they had been improved by crossing with sheep from Warwick. In the Vale of Evesham and Gloucester the stock was small, very few having been kept since the wet summer of 1782; both Cotswolds and the famous Ryelands were found there, the latter being near their native place in Hereford. Some of the Ryelands had been crossed with Dorsets and Shropshires and many other breeds.[21]

All over Wales sheep played an important part in the rural economy, particularly in the more mountainous parts. As one observer said in 1770: "The greatest part of the country consists of barren mountains, incapable of improvement. They serve, however, to subsist a great abundance of sheep."[22] The wool provided the raw material for the manufacture of Welsh flannel. At this date some flockmasters owned as many as fifteen thousand sheep.[23] Even in these wilds the passion for crossings had penetrated. Some New Leicesters and Dorsets had been brought to Cardigan, and Carmarthen had also experimented, while Carnarvon had imported breeding stock from Anglesey.[24]

The Midland Counties, or at least one of them, were the scene of

[20] Thomas Davis, *General View of the Agriculture of the County of Wilts*, 19–23 (London, 1794); *ibid.*, 137 ff., 207 (1813).

[21] William Marshall, *The Rural Economy of Glocestershire*, 1:208 ff., 2:79, 233 (London, 1789); George Turner, *General View of the Agriculture of the County of Gloucester*, 9–10, 27, 47 (London, 1794); Thomas Rudge, *General View of the Agriculture of the County of Gloucester*, 193–195, 305–311 (London, 1807).

[22] Joseph Cradock, *Letters from Snowdon: Descriptive of a Tour Through the Northern Counties of Wales*, 98 (London, 1770).

[23] John Dove, *Strictures on Agriculture*, 75 (London, 1770).

[24] George Kay, *General View of the Agriculture of North Wales* (Edinburgh, 1794); Arthur Aikin, *Journal of a Tour Through North Wales* (1797); J. Evans, *Letters Written during a Tour through South Wales* (London, 1804).

Bakewell's experiments, success, and influence. Berkshire and Oxford, however, had a breed of polled sheep, whose beauty and silken fleeces were commented on by William Gilpin in 1772, while the County Report indicates that the polled sheep of Berkshire were of the same type though crossing was common.[25]

Early in the century Northamptonshire had adopted turnips for feeding off with sheep. On the heath from Brackley towards Oxfordshire there was a small breed which made good eating and was probably much like other heath sheep.[26] Improvement was apparently begun here about 1770 when crossing with Warwick and Lincolns was introduced; by 1794 the renowned New Leicesters were coming in, but after the turn of the century there was more fatting than breeding.[27]

Throughout the Midland Counties Marshall divided the sheep into two classes: the shortwooled or field sheep and the longwooled on the enclosures. He mentioned that 1783 was a bad year for the rot, as had been the years 1735–1738, according to another source.[28] The first type was found on the Salop, Stafford, and Warwick hills. He hinted that Bakewell was not the absolute originator of the New Leicesters, which were begun by Joseph Allom of Clinton, who bought ewes at Melton of a man named Stone. Marshall held that the desirable breeds were the Lincoln and old Teeswater for the richest grassland, the New Leicesters for rich inclosed arable, the Wiltshire, Norfolk, or Southdown for well-soiled arable, where folding was practiced, the Ryelands for

[25] *Observations . . . Picturesque Beauty . . . Cumberland and Westmorland*, 1:35 (1786); William Pearce, *General View of the Agriculture in Berkshire*, 44 (London, 1794); W. F. Mavor, *General View of the Agriculture of Berkshire*, 381–387 (London, 1809); cf. Clement Cruttwell, *A Tour through the Whole Island of Great Britain*, 1:xxxi (London, 1801).

[26] John Morton, *The Natural History of Northampton-shire*, 10, 483 (London, 1712).

[27] James Donaldson, *Agriculture of Northampton*, 53–57 (Edinburgh, 1794); William Pitt, *General View of the Agriculture of the County of Northampton*, 128–132 (London, 1809); cf. Young, *Annals of Agriculture*, 6:455 (1786), 9:292 (1788).

[28] William Ellis, *A Compleat System of Experienced Improvements made on Sheep, . . . and the Shepherd's Sure Guide*, 120 (ed. 3, London, 1749), and *Modern Husbandman*, 2:141, May (London, 1750).

the finest cloths, and the Salops or more hardy for heathy mountains.[29]

Northwards from Leicester the sheep in Derby were much the same as in that county, but grew rapidly poorer in size and weight and quality of fleece as the higher altitudes were reached. The numerous goats formerly kept in the higher regions had vanished by 1795.[30] Marshall was able to say that the Yorkshire sheep had been much improved by 1788, the use of Leicester and Teeswater breeds, the former from George Culley and the latter from Mr. Collins, having been fruitful. The Moreland sheep were different and probably of Scotch descent. These were known as the Penistone breed and were horned, light in the forequarter, and well adapted for seeking their living in hilly country. When brought down to the lower pastures, they fattened easily and proved excellent mutton. There were, however, so many kinds in the county and they had been crossed so often that it could not be said to possess a distinct breed.[31]

Probably such sheep were fairly widely distributed throughout the Northern Counties, but early in the century they were apparently imported into Durham from Norfolk or other barren counties, because Edward Laurence advised that they should be bred under the eye and kept a week on the fallows before going on the best pasture.[32] The Weardale sheep were small, but the lower lands had bred huge sheep, presumably the Teeswater, which had

[29] William Marshall, *The Rural Economy of the Midland Counties*, 1:376–426 (London, 1790).

[30] John Aikin, *A Description of the Country . . . round Manchester*, 71 (London, 1795); cf. Thomas Brown, *General View of the Agriculture of the County of Derby*, 23–24 (London, 1794); John Farey, *General View of the Agriculture of Derbyshire*, 3:89 ff., 130–132 (London, 1817).

[31] William Marshall, *The Rural Economy of Yorkshire*, 2:219–222 (London, 1788); Aikin, *Description of the Country . . . round Manchester*, 96; Isaac Leatham, *General View of the Agriculture of the East Riding of Yorkshire* (London, 1794); [George] Rennie, Robert Brown, and John Shirreff, *General View of the Agriculture of the West Riding of Yorkshire* (London, 1794); [John] Tuke, *General View of the Agriculture of the North Riding of Yorkshire* (London, 1794); Robert Brown, *General View of the Agriculture of the West Riding of Yorkshire*, 186–188 (London, 1799).

[32] Edward Laurence, *The Duty of a Steward to His Lord*, xxviii (London, 1727).

been improved by an influx of New Leicester blood by 1810 and consequently reduced in size, but the heath sheep were of the same type as those of the Yorkshire Morelands.[33] Farther north, near Berwick-on-Tweed there were great flocks of a large longwool type of sheep in the latter half of the century. A few turnips were raised here for feeding but not so many as might have been.[34] In some parts of the country the sheep had been much improved by 1776 by the introduction of Leicester and Lincoln sheep. The fleeces had become much better and the weight improved. Few of the large sheep were then kept in Northumberland.[35] By the end of the century through Milfield to Wooler and on to the north the sheep were generally of the Dishley kind, but there were also some of a larger bone, like the Teeswater, and the farmers owned flocks of two to seven thousand. The Cheviot sheep were of the same kind that had been fed from time immemorial. About 1765 one Robson brought in Lincoln rams, and other kinds were imported at intervals, but finally, as usual, the size varied with the pasture.[36] Throughout Westmoreland and the mountainous part of Lancashire a hardy breed of small sheep, sweet as to meat but having coarse wool, was kept.[37] The small Herdwicks flourished in Cumberland from Windermere to Whitehaven and elsewhere a black-faced and coarse-wooled breed similar to the usual heath and mountain sheep was fairly distributed.[38]

The large county of Lincoln with its wide spread of heath had

[33] Joseph Granger, *General View of the Agriculture of the County of Durham*, 36 (London, 1794); John Bailey, *General View of the Agriculture of the County of Durham*, 248-255 (London, 1810).

[34] Charles Varlo, *A New System of Husbandry*, 2:86 ff. (ed. 4, Winchester, 1774).

[35] W. Hutchinson, *A View of Northumberland*, 2:448-449 (New Castle, 1778).

[36] John Naismith, *Observations on the Different Breeds of Sheep . . . in the Southern Districts of Scotland*, 21-27 (Edinburgh, 1795); cf. Young, *Annals of Agriculture*, 19:537-538 (1793); John Bailey and George Culley, *General View of the Agriculture of the County of Northumberland*, 19-24 (London, 1794); *ibid.*, 126-132 (London, 1797).

[37] A Gentleman, *A Tour from London to the Lakes in . . . 1791*, p. 74.

[38] Young, *Annals of Agriculture*, 20:2-4 (1793); John Bailey and George Culley, *General View of the Agriculture of the County of Cumberland*, 15-16 (London, 1794); *ibid.*, 199-212 (London, 1797).

always been famous for its large sheep. In the mid-century they were large, with coarse, hairy wool, similar to the Oxford, the Leicester, and the Cambridge.[39] Like the Warwicks, they were valued for the quantity of wool and not the fineness. Pamphlets were written in 1782 and thereafter in which it was said that the graziers of Lincoln had uniformly tried to increase the weight of the wool regardless of its other qualities. Complaints were also made that more attention was paid to the carcass than to the wool.[40] This was the general but not universal opinion; a critic of Stone's County Report said that the Lincoln sheep were the best for wool and in cold and wet situations, while the New Leicesters were good for meat, but only flourished in favorable conditions. Efforts were, indeed, being made to improve the defects of the sheep by crossing with rams from the Midland Counties.[41]

The practice of growing rape in the reclaimed fens of the Isle of Ely, Cambridge, and Huntingdon enabled many hundreds of sheep to be fattened to great advantage in this district from the early years of the century, but we are not told what type they were and by the time of the County Reports a mixture of breeds seems to have been fed here.[42]

Two of the earliest local descriptions remark upon the number of sheep kept in Norfolk and Suffolk, and the early culture of turnips in these counties, which, together with their comparative

[39] Ellis, *A Compleat System of Experienced Improvements made on Sheep*, 43–45.

[40] A Gentleman Farmer, *An Inquiry into the Nature and Qualities of English Wools, and the Variations of Breed in Sheep*, 4 (London, 1782); cf. *A Short View of the Proceedings of the Several Committees held in Consequence of the Intended Petition to Parliament*, 1782, which contains a list of pamphlets issued in that year. See also Thomas Stone, *An Essay on Agriculture*, 185–187 (Lynn, 1785).

[41] A native of the County (Lincoln), *Essays on Agriculture Occasioned by Reading Mr. Stone's Report on the Present State of that Science*, 50 ff. (London, 1796); Thomas Stone, *General View of the Agriculture of the County of Lincoln*, 61 (London, 1794); Arthur Young, *General View of the Agriculture of the County of Lincoln*, 192–193, 304 ff., 366–367 (London, 1799); George Culley, "On Live Stock" in Alexander Hunter's *Georgical Essays*, 4:593–596 (York, 1803).

[42] Samuel Trowell, *A New Treatise of Husbandry, Gardening, and Other Curious Matters Relating to Country Affairs*, 30 (London, 1739); Charles Vancouver, *General View of the Agriculture in the County of Cambridge*, 205–206 (London, 1794); Thomas Stone, *General View of the Agriculture of the County of Huntingdon*, 14–15 (London, 1793); George Maxwell, *General View of the Agriculture of the County of Huntingdon*, 9, 17 (London, 1793), and later editions.

proximity to London and the wide areas of heath and marsh, put them in a favorable position for this branch of farming.[43] In the early part of the century carrots were cultivated for cattle as well as for household use.[44] Two types of sheep were kept in Norfolk in Marshall's time, the small heath and the type that had been improved by the infusion of Lincoln, Huntingdon, and Leicester blood, but Marshall did not think the beautiful Leicesters would survive on the heaths.[45] The Southdowns had been introduced into Norfolk by 1804, and various other crosses had been tried, but the majority of the sheep were of the native breed, improved.[46] The same breed occupied practically the whole of Suffolk at this time, but other breeds were gradually coming in.[47]

Sheep bred in Hertfordshire in the middle of the century, although of the same type,[48] were not quite so good as the Western sheep brought in for grazing in that county and in Buckingham, Bedford, and Middlesex. By the end of the century breeding had been practically given up here as in the other counties named, a variety of sheep being acquired for grazing. The same might be said for Essex.[49]

As was the case with cattle, the purchase of a particular type

[43] Gentleman of the Inner Temple, *A Description of the Diocese of Norwich*, 3, 9 (1735); John Kirby, *The Suffolk Traveller*, 2 (1732); cf. Daniel Defoe, *A Tour through the Whole Island of Great Britain*, 1:93 (1724).

[44] Trowell, *New Treatise of Husbandry*, 21.

[45] William Marshall, *The Rural Economy of Norfolk*, 1:362–367 (London, 1787); cf. Agricola Sylvan, *The Farmer's Magazine*, 3:168 ff. (London, 1778); Charles Onley, "On Wool, Sheep, &c.," in Bath and West of England Society, *Letters and Papers on Agriculture, Planting, &c.*, 6:144–145 (Bath, 1792).

[46] Nathaniel Kent, *General View of the Agriculture of the County of Norfolk*, 32, 33 (London, 1794); [Arthur Young], *General View of the Agriculture of the County of Norfolk*, 447–457 (London, 1804).

[47] Arthur Young, *General View of the Agriculture of the County of Suffolk*, 33 (London, 1794); *ibid.*, 189, 190 (London, 1797).

[48] Ellis, *A Compleat System of Experienced Improvements made on Sheep*, 43.

[49] D. Walker, *General View of the Agriculture of the County of Hertford*, 13 (London, 1795); [Arthur Young], *General View of the Agriculture of Hertfordshire*, 185–194 (London, 1804); cf. the reports on other counties. Charles Vancouver, *General View of the Agriculture in the County of Essex*, 128 (London, 1795); [Arthur Young], *General View of the Agriculture of the County of Essex*, 2:308–339 (London, 1807); cf. Pennant, *Journey from London to the Isle of Wight*, 1:39.

of sheep was recommended for the breeding flock, and there is no indication that the writers of the didactic treatises wished the points to vary according to the different breeds purchased. This is, perhaps, a sign that there was no very great preference for breed, or that the choice was left to the farmer and that the points should be applied to all types so far as possible within the limits of each particular type. Mortimer recommended "a young ram for breeding. The animal should have a large, long body, broad forehead, cheerful and large eyes, nostrils straight and short. The ewe should have a neck like a horse, a broad back, round buttocks, thick tail, small legs, but short, clean and nimble. Her wool should be thick and deep, covering her all over."[50]

Bradley, some twenty years later, slightly modified this advice. Ewes should be bought at two years old. They should be full-bodied, deep-stapled and the wool thick and curled, the belly well covered, the neck long and the legs short. The ram should have eyes full and ruddy, ears large, breast and haunches broad, testes large, tail broad and long, wool white, deep, greasy, and close. Those with black spots on the tongue should not be purchased, for they would give black or mottled sheep. Josiah Ringsted practically repeated this advice as did Robert Brown and William Ellis, but the latter preferred the Western or the Hertford sheep to all others for breeding. This was, perhaps, natural, because these seem to have been very much akin and in Hertford and neighboring Buckingham it had long been the habit to buy Western sheep. The Western ram should be a four tooth.[51]

Estimates of the amount of land required to keep sheep are fairly frequent, and these vary with the type of grazing and the breed of sheep kept as well as the kind of farm, i.e., inclosed or open field, sheep walk, down, or mountain. The early Society of Improvers in Agriculture described the stocking and cropping of a

[50] Mortimer, *Whole Art of Husbandry*, 177 ff.

[51] Richard Bradley, *The Gentleman and Farmer's Guide for the Increase and Improvement of Cattle*, 2 ff. (London, 1729); Josiah Ringsted, *The Cattle-Keeper's Assistant*, 52–53 (ed. 9, London, 1774); Ellis, *A Compleat System of Experienced Improvements made on Sheep*, 51, 64; *Compleat Farmer*, 32.

500-acre farm in Yorkshire, a sufficiently vague situation. One hundred acres were in tillage, 250 in pasture, and 150 put up for hay. The pasture kept 6 horses, 8 oxen, and 100 ewes for lambs sold fat. The farmer also bred cattle and sheep. He kept 15 cows and wintered 300 wethers. He also fattened 25 oxen yearly, so that there was fairly heavy stocking here.[52] Bradley, in giving estimates of the requirements of a 100-acre farm in live and dead stock and the probable gain to be obtained, set out the sheep at two large wethers an acre, while at about the same date Romney Marsh was said to feed three sheep with 4½-pound fleeces on an acre.[53] Thirty years later Thomas Hitt, writing on the reclamation of heath land, suggested 500-acre farms, on each of which 100 ewes and their offspring should be kept, and estimated the annual clip at 250 fleeces.[54] Incidental to his particular thesis the anonymous writer of *Political Speculation* (1767) set out what he considered the economy of a 200-acre farm, and among other items suggested grazing six sheep to two acres of pasture.

Young supplied a whole list of the capacity of various fodder crops for feeding beasts, the most concise of these appearing in *Rural Oeconomy*.[55] As this was written in the early days of his career, his estimates, especially with regard to roots and the more recently introduced legumes and grasses, are probably speculative. Some of them, however, may have been derived from hearsay and accepted as generally held opinions on that basis. He said that the product of grassland varied between keeping three middle-sized sheep per acre and fatting an ox of from 90 to 100 stone and a large Lincoln sheep, but since most of the estimates given for feeding combinations of cattle and sheep appear highly arbitrary, they are omitted. Scattered through Young's three *Tours* are a large number of local opinions as to the capacity of

[52] [William Mackintosh], *A Treatise concerning the Manner of Fallowing of Ground . . .*, 50–51 (Edinburgh, 1724).

[53] Bradley, *Complete Body of Husbandry*, 316, 318; Daniel Defoe, *An Humble Proposal to the People of England, for the Encrease of Their Trade*, 37 (London, 1729).

[54] Thomas Hitt, *A Treatise of Husbandry on the Improvement of Dry and Barren Lands*, 57–58 (London, 1760).

[55] Arthur Young, *Rural Oeconomy*, 133–148 (London, 1770).

the land both for sheep and cattle, but their repetition would be tedious and add but little to the other evidence.

A general statement, not without interest, is that made by Matthew Peters. He estimated that a sheep of 20 pounds a quarter will eat upwards of 20 pounds in twenty-four hours.[56] In Scotland it was believed that sheep could advantageously be fed on turnips, "a good cart load to every five score sheep" in a dry grass field, and that "cabbages may be applied in every way in the same respect with turnips."[57] Again, a Society of Farmers said that "one acre of tolerable good pasture ground, will scarcely afford sustenance throughout the year for five sheep of such a size as are usually bred on the best commons, viz:—weighing, when fat, fifty or sixty pounds, or about seven stone London weight."[58]

The County Reports contain estimates similar to the information in Young's *Tours* and, no doubt Luccock obtained some of his figures on sheep population from them. It was, however, Sinclair's intention to condense the reports in the *Code of Agriculture*, and we already know that the Lincoln sheep were considered the largest and the salt marshes of the county the best grazing land. Sinclair held that "The stock maintained per acre *on the best grazing lands*, surpasses what could be fed by any arable produce" and in support of that opinion said: "It is not at all uncommon to feed, at the rate of, from six to seven sheep, (24 lb. a quarter), in summer; and about two sheep in winter." Norfolk, on the other hand, had kept only two sheep per acre on the inferior soil before the sheep walk was broken up for arable.[59]

The general principles which guided the average farmer in the care of his sheep are laid down in most of the didactic treatises. The preliminary wisdom was to bring sheep from poor to better pastures for fattening. This was axiomatic at the beginning of

[56] Matthew Peters, *Winter Riches*, 10 (London, 1771).

[57] Select Transactions of the Society . . . Agriculture . . . Dumfries, Wigton and Kirkcudbright, no. 2, p. 102 (1776).

[58] *A Political Enquiry into the Consequences of Enclosing Waste Lands . . . Being the Sentiments of a Society of Farmers in -shire*, 55 (1785).

[59] Sir John Sinclair, *The Code of Agriculture; including Observations on Gardens, Orchards, Woods, and Plantations*, 388, 391 (London, 1817).

the century, and was repeated constantly.[60] In the early days it was said that they pastured best on downs, but should be kept bare in the summer. If they were, and then turned into thriving pasture towards winter, "they will keep their Fleeces whole upon their Backs, and be able to weather out the sharpest of that Season." They were also advantageously fed on the fallows. Already long leys of clover were used not only for sheep, but for pigs and horses and sometimes for cattle in Hereford, Worcester, and some parts of Gloucester.[61]

Bradley's views, which may or may not have been gathered from practical men, are scattered through his writings. He held to the opinion that full feeding during the period of growth made large bodies, and that meagre feeding, as in upland pastures, made small bodies and fine-haired pelts. He also enunciated a scheme for bringing lambs to birth all the year round. Lambs should be weaned in May if born at the normal time, and in June the sheep should be washed on one day and sheared the next. During September the sheep should still be folded on the fallows or the ground for wheat, in December turnips should be first given them, but if they were on commons they should have fresh hay. He also thought that the diversity of sheep was due to the difference in the feeding value of pastures, and knew that the rot was caused by dampness. Ranunculus, crowfoot, and pennywort in the pasture showed that it was not good for sheep, and light fallows were bad for them because they ate roots and dirt. The farmer was cautioned not to overstock his ground and told that ewes of two to three years and rams of four or five to seven were the right age for breeding. Wethers should be fatted for spring markets, and milking ewes was considered bad practice although cheese could be made of mixed sheep and cow's milk. He also thought that after shearing, ewes, rams, wethers, and lambs should go to pasture separately.[62] Trowell reported that

[60] Thomas Tryon, *England's Grandeur and Way to Get Wealth*, 15 (1699).

[61] Timothy Nourse, *Campania Foelix, or, A Discourse of the Benefits and Improvements of Husbandry*, 32–40, 45–49 (London, 1700).

[62] Richard Bradley, *General Treatise of Husbandry and Gardening*, 164, *The Country Gentleman and Farmer's Monthly Director* (ed. 2, 1727), and *Gentleman and Farmer's Guide*, 2–37.

one farmer in the New Forest was growing parsley for sheep feed before 1739, and warned his readers of the bad management shown by allowing cattle and sheep in the same pasture at the same time.[63] The Chiltern farmers, who bought sheep to fatten for the market, purchased both two- and three-year-olds. The first were folded for two summers, especially on artificial grass, then put on stubbles in August, and afterwards finished off on turnips. The three-year-olds were kept for only one year and then treated the same. At that time the sheep were kept largely for the purpose of dressing the land and Ellis said that he could not have carried on his farming in common open-field land without them. One acre of turnips would, in his opinion, feed more sheep than many acres of meadow grass in winter, and would last, if sown late, till April when the grass was ready. By this time turnips were much grown in Cambridge, Suffolk, Norfolk, Essex, and Herts. Sheep were folded on them at Allhallows, and at Christmas store sheep followed the fatting stock. Where there were no turnips the sheep were finished on peas or beans in bins with some hay and water.[64] Ringsted thought a frequent change of pasture was salutary and that the end of June was the best shearing time.[65] Because there was often a lack of fodder in January, the sheep were turned into the young wheat at that season.[66] Service was timed so that the lambs were dropped when the young grass was ready or when turnips were available, and Hale advised that they should be weaned at four months.[67] Hampshire and Wiltshire bred what were known as Weyhill sheep. These were brought up in Middlesex and around London where they were suckled in pens for speedy fattening and sold as lamb.[68] In Gloucester the sheep were housed every night and

[63] Trowell, *New Treatise of Husbandry*, 13, 48; cf. [James] Donaldson, *Husbandry Anatomiz'd, or a New Treatise of Husbandry*, 32 ff. (Edinburgh, 1746).

[64] Ellis, *A Compleat System of Experienced Improvements made on Sheep*, 51, 198, 209, 212, 216.

[65] Ringsted, *Cattle-Keeper's Assistant*, 53, 57; Edward Lisle, *Observations in Husbandry*, 259 (London, 1757).

[66] Ellis, *Modern Husbandman*, 1:87, January.

[67] Hale, *Compleat Body of Husbandry*, 221–224.

[68] *Ibid.*; cf. Brown, *Compleat Farmer*, 36.

littered with clean straw, "which affords a great advantage to their land by the manure, and they say makes their wool very fine."[69]

The problem of spring feed was still in the minds of flockmasters in 1771, although this had been solved in some parts by the use of the more recently introduced artificial grasses and roots. Rye and barley or rye and oats sown after the wheat had been harvested was still considered good fodder for sheep in February or March and would last until May. This could be followed by buckwheat, vetch, rape, or turnips, which could be eaten off or plowed in.[70] Nevertheless at this time sheep were not considered very profitable, rather the reverse, even in Devon and Dorset.[71] There was a general feeling that the quality of wool was declining, and John Mills expressed the desirability of reestablishing the best kinds of sheep in England and greater care of fleeces. They must not be fed on wet ground and all the new crops, burnet, lucerne, clover, turnips, and carrots, were good for them. Old ewes should be selected for fattening every year and the best use should be made of the sheepfold.[72] On light, chalky, or sandy soil in Kent, Hertford, Buckingham, Oxford, and some other counties, the penning of sheep had been found an easy and cheap improvement.[73]

In Wales the sheep were mainly fed on the mountains, and in Llangollen Vale the heath was burned annually so that there would be young shoots for the sheep. By the end of the century the goats which formerly had grazed on Snowdon in great numbers had given place almost entirely to sheep.[74] In the south, at Kidwelly, for instance, the sheep were in the care of the common shepherd during the summer months and wintered on leys in the higher ground. The shepherds in the mountains were not paid in money, but had the privilege of running a few sheep of

[69] Brown, *Compleat Farmer*, 36; cf. Mortimer, *Whole Art of Husbandry*, 177 ff.

[70] Peters, *Winter Riches*, 11.

[71] Thomas Comber, *Real Improvements in Agriculture*, 44 (London, 1772).

[72] Mills, *Treatise on Cattle*, 324–361.

[73] A Gentleman Farmer, *Enquiry into the Nature and Qualities of English Wools*, 24; cf. Young, *Annals of Agriculture*, 19:75.

[74] Aikin, *Journal of a Tour Through North Wales*, 21, 152.

their own with the flocks they watched.[75] At the opposite side of England where all the improvements were being tried out, it is amusing to learn that sheep were kept in some parts of East Suffolk *"because the ling is of a good growth."*[76]

Throughout the century it was realized that rot was caused by damp and that dry food was good for it.[77] Beans were useful in this connection, but the sheep should be given hay or dry feed. A pill of crude antimony, tartar and nitre- stillate of antimony powdered, infused in a pint of ale for a few days, ¼ ounce Grains of Paradice, and a little brown sugar was supposed to be medicinal, but the sheep should feed only on uplands at midday in spring.[78] The farmer in the New Forest who grew parsley as a feed for sheep probably did so because of the very general idea that it was good for the rot.[79]

It will be observed that Young's writings have not been used very extensively in dealing with the story of sheep. Young was a propagandist for innovations and certainly in his youth his enthusiasm led him into endorsing systems about which he afterwards changed his mind. Moreover, his real interest was in the work of the improvers as exemplified by such people as Robert Bakewell, John Ellman of Glynde, Thomas Coke of Norfolk, the Duke of Bedford, and the numerous others whose experiments fill his writings with interesting and absorbing matter. These people were the advance guard and what they did has been so emphasized as to become the general idea of eighteenth century breeding. Although their influence was undoubtedly felt in ever-widening circles—we have seen how extensively the Dishley sheep were used for crossing at the end of the century and thereafter—their principles were not those of the general farming community. At the end of the century the proportion of farmers receptive to new methods both in crop culture and stock breeding was undoubtedly very much larger

[75] Evans, *Letters*, 203, 311.
[76] Young, *Annals of Agriculture*, 23:36 (1795).
[77] Mortimer, *Whole Art of Husbandry*, 177 ff.
[78] William Ellis, *New Experiments . . . for . . . April*, 39 ff. (London, 1736).
[79] Brown, *Compleat Farmer*, 37; Mills, *Treatise on Cattle*, 371.

than at the beginning, but in spite of the growth of wealth in the farming class, a temporary phenomenon, there were still extensive areas where the practices were little different from those of the great-grandfathers of the inhabitants.

Pig meat formed a large proportion of the flesh consumed by the rural inhabitants, but it is impossible to obtain even an approximation of the pig population of the country. For some unfathomable reason, much less attention was paid to these universal and useful animals than to sheep and cattle. It was not until well in the nineteenth century that Arthur Young's reproach to the farmers for neglecting this source of profit ceased to be justified.[80]

There are, nevertheless, descriptions of the most desirable types and the earliest of these is given by Mortimer. He thought that pigs should have long, large bodies, deepsided and bellied, a short nose, thick thighs, short legs, high claws, a thick neck, short, strong groin, and thick chine. This, with only verbal modifications, was repeated by a number of writers until John Mills defined the characteristics of the sexes.[81] "The boar for propagating should be short and thick of body, rather square than long, with a large head, a flat short snout, large flagging ears, small fiery eyes, a large thick neck, a swagging belly, broad buttocks, short thick legs, . . . In the sow, the body should be long, the belly broad and capacious, and the teats long."

Complete agreement as to the districts in which the best types were bred did not exist, but this was owing partly to ignorance of other localities in the book farmers and partly to noncritical copying of earlier works. The general phrase is that the best pigs were raised in Leicester, Northampton, and the clay countries bordering on Leicester, and this opinion was held in the early years of the eighteenth century. The superiority of these pigs and their large number as compared with other districts were

[80] Ernle, *English Farming*, 357.

[81] Mortimer, *Whole Art of Husbandry*, 184 ff.; John Laurence, *A New System of Agriculture*, 147 (London, 1726); Brown, *Compleat Farmer*, 40; Hale, *Compleat Body of Husbandry*, 226; [John Ball], *Farmer's Compleat Guide*, 414; Mills, *Treatise on Cattle*, 402.

believed to be the result of the great quantities of pulse grown in those counties.[82] A more detailed classification is provided by Bradley. According to him the best pigs were the Hertfordshire or Lincoln, the Black breed, or the cross between the two. The first had long and large bodies, long legs, long and thick necks, deep sides, stag bristles, and were some 12 to 13 hands high; the second were black, had short heads and necks, were very deep-sided and bellied, almost reaching the ground, had thick gammons, short legs, were short-snouted, thick-chined and had strong bristles and did not exceed eight hands; the third were of middle size, being about ten hands. Brown subscribed to Bradley's opinion, but thought the Hertford were heavy feeders. Hale, on the other hand, thought the Hampshire, Leicester, and Warwick type produced best, and Cuthbert Clarke agreed with him.[83]

Marshall's writings, supplemented by the County Reports, supply details of pig breeding at the end of the century. In Norfolk a considerable number were kept. They were not large, from 15 to 20 stone being a good weight for a fat, well-grown hog. Both the newly introduced Chinese and the Berkshire were used, but in the main the pigs were a motley mixture. To Kent they appeared small, but prolific, and in Young's opinion they demanded no particular attention. Gloucester had a long, white breed, the true "Gloster" breed, but in the seventeen-eighties these had been crossed with Berkshires, and there was some Oriental blood. After the turn of the century the fat pigs of from 10 to 20 score were most esteemed by the buyers. The long white, however, reached 30 score, but were crossed for home consumption. There were all sorts and mixtures, few unmixed "old Glosters" remaining; the most frequent cross was between the Berkshire and the

[82] Ernle, *English Farming*, 139, citing Markham and Mortimer; A. S., Gent., *Husbandman, Farmer and Grazier's Compleat Instructor*, 86; cf. Laurence, *New System of Agriculture*, 147; Bradley, *Gentleman and Farmer's Guide*, 75; Brown, *Compleat Farmer*, 40.

[83] Bradley, *Gentleman and Farmer's Guide*, 66 ff.; Brown, *Compleat Farmer*, 44–46; Hale, *Compleat Body of Husbandry*, 226; Clarke, *True Theory and Practice of Husbandry*, 127.

"Turkey," or slouch-eared. The modern farmers in the much-praised Midland Counties kept a number of pigs that were above par, the others only a few. Moreover, the swine were extra large, weighing from 30 to 40 stone. The majority were the large black and white Berkshire breed, but there were some half-breed Chinese. Yorkshire preferred the black, sandy Berkshire, but some Chinese were used for crossing, and these were described as the native breed, a long-eared kind. Towards the end of the century the Berkshire and in some counties the Hampshire were generally approved for crossing, while the Chinese were also finding favor. Such counties as Derby, Warwick, Buckingham, Durham, Essex, even Hampshire, Huntingdon, Leicester, Northampton, Northumberland, Salop, Somerset, Surrey, and Sussex had all used the Berkshire, and an equally wide range of districts had adopted the Chinese or were trying out some other types of crossbreeding.[84]

The swine were fed on peas and beans in Leicester and its neighborhood. In other districts acorns and mast, as in earlier times, were the staple when ripe. Mortimer intimated that they should have plenty of water and that offal grains might be used in a shortage of acorns and mast. He said that barley was used for feeding bacon in addition to its primary use for making beer.[85] Bradley recommended putting up swine to fatten in July and killing the first hogs for pork in August and others for bacon and pork in October. A Hoxton fishmonger tried feeding his hogs with stale, unsold fish, and the bacon was disagreeable, which recalls a modern difficulty in feeding fishmeal. One hog

[84] Marshall, *Rural Economy of Norfolk*, 1:372–373; Kent, *General View of the Agriculture of . . . Norfolk*, 381; [Young], *General View of the Agriculture of . . . Norfolk*, 478; Marshall, *Rural Economy of Glocester*, 1:316; Rudge, *General View of the Agriculture of . . . Gloucester*, 193, 322; Marshall, *Rural Economy of the Midland Counties*, 1:451–452; cf. Richard Davis, *General View of the Agriculture of the County of Oxford*, 26 (London, 1794); John Wedge, *General View of the Agriculture of the County of Warwick*, 37 (London, 1794); William Pitt, *A General View of the Agriculture of the County of Leicester*, 295 (London, 1809), *General View of the Agriculture of . . . Northampton*, 219, and *General View of the Agriculture of the County of Stafford*, 211 (London, 1808); Marshall, *Rural Economy of Yorkshire*, 2:235; Tuke, *General View of the Agriculture of the North Riding of Yorkshire*, 69.

[85] Mortimer, *Whole Art of Husbandry*, 184 ff., 257.

for every cow was recommended in the dairy districts to eat the milk offals, skim milk, buttermilk, whey, etc. Malt grains were also useful according to Bradley. For pork he estimated that 12 bushels of barley meal or 16 strike of peas would fat a hog; for pickle-pork, 3 pints of horse beans and common food for a week, then ¾ of a bushel of peas would finish off the hog. Acorns were, he thought, better than horse beans, and he gave a description of an automatic hopper for feeding, as well as cures for diseases. Ringsted agreed with the ratio between cows and hogs and suggested keeping one boar for every ten sows; the boar should be gelded at five years old and fattened. The sties should be kept clean.[86] Ellis thought that young stoats did well on clover, especially the Black breed. They should be turned into the clover with the cows, brought home at night and given whey, skim milk, wash, grains, or corn. Fish, he said, gave the bacon an oily taste, but was nevertheless used near the North Sea. In August hogs and cows could be put on the stubbles, in November the hogs should go out to feed on beech mast.[87] Like some of the modern pigkeepers, Hale held that pigs could live on anything, but would do well in the woods. They should be fattened on peas or meal of offal corn; the process would take a month. A description of an automatic feeder used in Oxfordshire for this purpose is given for the benefit of other counties. Pigs could be fed on clover, but not alone. They should be given no breakfast and turned out with the cattle, being given a large feed of wash mixed with grains of corn, skim milk, or whey in the evening. Bran or pollard was a good fattener, but not, in his opinion, so good as peas or beans. Distiller's wash and grains would not produce as good bacon as the natural fruit of the trees.[88] A suggestion was also made at about this time that swine would thrive well on lucerne, while the increasing use of clover led Matthew Peters to estimate that an acre of this crop would

[86] Bradley, *Country Gentleman's and Farmer's Monthly Director*, and *Gentleman and Farmer's Guide*, 71, 77, 102, 110 ff.; Ringsted, *Cattle-Keeper's Assistant*, 65 ff.; cf. Brown, *Compleat Farmer*, 46–50.

[87] Ellis, *New Experiments . . . for . . . April*, 70, and *Modern Husbandman*, 2:138–139 (May), 5:101 (August), 4:89 (November).

[88] Hale, *Compleat Body of Husbandry*, 227–228; cf. Young, *Rural Oeconomy*, 169.

feed three sows and their litters, or eighteen large pigs for six or seven months.[89] Whatever their diet, the common way of fattening hogs was "to give them plenty of barley, mast, cabbage, and other greens boiled, and a great deal of water mixed with bran."[90] Some people were beginning to experiment with pigs as with other animals, and experiments in feeding hogs on boiled potatoes and barley meal with details of the quantities fed and hogs sold were recorded. This became the practice in Hampshire and Staffordshire, while on another farm where horses were fed on carrots, these were washed and topped and tailed and the swine were fed on this refuse. However, the principal food of the pigs was milk and then peas.[91] In Norfolk some were fattened on buckwheat, while in Gloucester they were fed on whey, buttermilk, and beans, either crushed or whole, and in the Midland Counties oats were believed to be preferable to barley as a food, although barley meal was chiefly used for fatting.[92]

Though horses were the most general source of motive power, limited attention was given to the improvement of breeds during the eighteenth century, and we cannot illustrate this better than by quoting Ernle *in extenso*. Even in the nineteenth century "Oxen were still extensively used for farm work. It is therefore not surprising that comparatively little attention had been paid to horses for agricultural purposes. Yet here, too, some progress was made, particularly from the point of view of specialisation. The Clydesdales were coming to the front as rivals to old English breeds. Beauty was not the strong point of the 'Sorrel-coloured Suffolk Punch.' Nor was he any longer suited to the pace required in the modern hunting-field or on the improved roads.

[89] Walter Harte, *Essays on Husbandry*, 137 (London, 1764); Matthew Peters, *The Rational Farmer*, 39, 41 (ed. 2, London, 1771).

[90] Mills, *Treatise on Cattle*, 398.

[91] George Winter, *A New and Compendious System of Husbandry*, 220 (Bristol, 1787); A. and W. Driver, *General View of the Agriculture . . . of Hants*, 27; Pitt, *General View of the Agriculture . . . of Stafford*, 64 (London, 1794); Robert Billing, *An Account of the Culture of Carrots, and their use in Feeding and Fattening Cattle*, 20 (London, 1765).

[92] Marshall, *Rural Economy of Norfolk*, 1:373, *Rural Economy of Glocester*, 1:317, and *Rural Economy of the Midland Counties*, 1:453–454.

But in 1837 it was recognised that his unrivalled power of throwing his whole weight into the collar fitted him pre-eminently for farm work. A similar change was passing over the Cleveland Bay. Threatened with extinction by the disappearance of coaches, he was found to be invaluable on light-soil farms. So also a definite place was assigned to another breed known to the sixteenth century. The 'Large Black Old English Cart-horse,' which Young calls 'The produce principally of the *Shire* counties in the heart of England,' was, to some extent, experimented upon by Bakewell. But the development of the breed belongs to a later date than the first half of the Victorian era, and it is as a draught-horse that the Shire has been, since 1879, patronised by Societies and enrolled in stud-books."[93]

This statement explains clearly why there are so few references to the farm horse, although there are plenty to the breeding of horses for hunting and racing, carriage work, etc. While this type of breeding was certainly a branch of farming, it was, with the exception of the coach and post horses, just as it is today, a more specialized job, largely in the hands of gentlemen and their grooms. Ernle said the midland horse was bought by farmers in the home counties at the age of two or three years, worked on the farms till about six, and then sold to London for use as a coach horse. Probably this was done increasingly throughout the seventeenth as well as the eighteenth century. The best age for a breeding mare, added Mortimer, was from four to twelve, and for a horse, five to fourteen.[94] Mills set out the desirable qualities in horses for "carts, waggons, drays, the plough &c." as "stone-horses of a common breed, and strongly made, . . . As they draw with a collar, there is a necessity for their being well set; their chest should be large, and their shoulders thick." This is probably proverbial wisdom derived from much earlier writers as is Hale's advice not to use cart or plow horses for the saddle. Hale, indeed, thought that any strong horse was suitable for plow work, no matter what its shape, but cart horses should be big-breasted, large-bodied, and strong-limbed, and care should

[93] Ernle, *English Farming*, 357–358; cf. 181–184.
[94] Mortimer, *Whole Art of Husbandry*, 149.

be taken to get them as near to each other in size as possible, so that they would be interchangeable and would also work well together. If mares were used for farm work as well as for breeding they should be chosen with a good forehand, principal regard being had to the neck, breast, and shoulders, otherwise the shape was not of much consequence. The body should, however, be large so that the foal might have room while growing in the mare's belly. The pack horse should be a small, stout horse with a broad back and ribs, full shoulders and withers.[95] Brown estimated that a team of five horses was required for 50 acres of fallow, but Young, probably having in mind the lighter land of the eastern counties, thought four sufficient for 80 acres of arable.[96] A large part of the country at one time bought horses from the Midlands; Marshall noted that the horses in Kent were formerly bought from Northants, but when he visited the county some were being bred in the district of Maidstone. The six Zealand mares mentioned by Ernle as being used to improve the midland breed were imported by Lord Chesterfield. The horses were sold as yearlings at fairs to graziers and then at Stafford and Rugby to arable farmers or dealers of Bucks, Berkshire, Wiltshire, and the western counties when they reached $2\frac{1}{2}$ years. They were then worked until between five and six, when they were sold to London and sacrificed to the heavy work of the city and its pavements. Other counties where breeding, as apart from the purchase of the Midland stock, was practiced at the end of the century, were Dorset, a few being bred in the Blackmoor Vale; Hampshire, where they were bred for draught, but not for the saddle; Kent, where native mares were served by half-bred Flemish stallions; Lancashire, which produced strong horses; and Lincoln, Suffolk, and the North Riding of Yorkshire in the Vale of York and Ryedale. Moreover, a traveller was surprised by the beauty of the horses both in North and South Wales, which, although

[95] Mills, *Treatise on Cattle*, 61; cf. Brown, *Compleat Farmer*, 2-7; [Gervase Markham], *Country Gentleman's Companion, by a Country Gentleman from His Own Experiences* (London, 1753); Hale, *Compleat Body of Husbandry*, 198-199.

[96] Young, *Rural Oeconomy*, 15; cf. Hale, *Compleat Body of Husbandry*, 204.

dearer than they were formerly, were still cheap in 1791.[97] There were, of course, the wild or semiwild ponies of the New Forest and the small horses in Devon and Cornwall used for carrying goods on pack saddles.

The use of the newly introduced grasses for horse fodder was early recognized. Timothy Nourse sang the praises of sainfoin for horses in 1700, and the advantages of lucerne for the purpose were constantly animadverted throughout the century, while a reference to Billing's experiment in feeding horses with topped and tailed carrots has already been given.[98]

It is probable that apart from specialized districts like Dorking for fowls, Aylesbury for ducks, and Norfolk and Suffolk for turkeys and geese, poultry were very generally kept and that most of the produce was consumed locally. Eggs were produced for sale in Glamorgan, but it is unlikely that they were sent any distance. The places mentioned, however, were famous for the products named, but it would be supererogatory here to go into great detail on the subject since a specialized treatise was published a few years ago. Beekeeping was specialized in only a few counties, like Hampshire, but it is probable that honey was fairly generally produced for home or local consumption, especially by those who occupied the smaller farms or the cottagers.[99]

G. E. FUSSELL

Ministry of Agriculture and Fisheries
London, England

[97] Marshall, *Rural Economy of the Southern Counties*, 1:320, and *Rural Economy of the Midland Counties*, 1:306–307, 311–312. See County Reports, 1794 edition. E. D. Clarke, *A Tour through the South of England, Wales, and Part of Ireland*, 277 (London, 1793).

[98] Nourse, *Campania Foelix*, 47–50; Bradley, *Country Gentleman's and Farmer's Monthly Director*, 52 (ed. 6, 1736); Bartholomew Rocque, *A Practical Treatise of Cultivating Lucern*, 18–19 (London, 1761); Robert Dossie, *Memoirs of Agriculture, and Other Oeconomical Arts*, 2:2 (London, 1771); Clarke, *True Theory and Practice of Husbandry*, 216.

[99] Edward Brown, *British Poultry Husbandry: Its Evolution and History* (London, 1930). See *Topographies*; Francis Forbes, *The Improvement of Waste Lands* (London, 1778); and pamphlets on the controversy about large and small holdings.

NEWS NOTES AND COMMENTS

THE 1937 ANNUAL MEETING OF THE AGRICULTURAL HISTORY SOCIETY

The 1937 annual meeting of the Agricultural History Society consisted of three sessions.

A luncheon in honor of Dr. Henry C. Taylor, the retiring president, was given on April 15 in the dining room of the Department of Agriculture. Representative officials of the bureaus of the Department discussed the value of agricultural history broadly interpreted and the means of developing this field of work.

The literary session was held at the Washington residence of the Honorable Gifford Pinchot on the evening of April 15, and Mr. Pinchot's address on "How Conservation Began in the United States" was enthusiastically received. About one hundred and fifty members and guests of the Society were present.

The annual business meeting was held in the South Building of the Department of Agriculture on the night of April 16. Mr. Everett E. Edwards, the editor of *Agricultural History*, discussed the articles available for publication and urged that the size of the journal be increased. Dr. Carl C. Taylor, Dr. Henry C. Taylor, Dr. O. C. Stine, Miss Mary G. Lacy, and others made suggestions, and a resolution was voted authorizing the editor to double the size of the quarterly.

Mr. Everett E. Edwards, acting as teller, announced that ballots had been distributed to the members of the Society and that the following officers had been elected for the year 1937–38: president, Dr. M. L. Wilson, Under Secretary of Agriculture; vice president, Dr. Frederick Merk of Harvard University; secretary-treasurer, Dr. O. C. Stine of the U. S. Bureau of Agricultural Economics; elected members of the executive committee, Dr. Russell H. Anderson of the Museum of Science and Industry, Chicago, and Dr. Wendell H. Stephenson of Louisiana State University. These names accord with the recommendations of the nominating committee which consisted of Dr. Solon J. Buck of the National Archives (chairman), Mr. Herbert A. Kellar of the McCormick Historical Association, Chicago, and Mr. Donald Jackson of the U. S. Bureau of Agricultural Economics.

Dr. T. R. Shellenberg of the National Archives discussed the archives of the U. S. Department of Agriculture. He mentioned that there is twice as much material in the field offices as in the Washington offices, and emphasized the value of this material to research workers. Dr. Shellenberg pointed out that much of it was very inaccessible and that some of it was badly organized. On the basis of preliminary surveys by deputy examiners, the National Archives is now preparing a much-needed guide to the archives of the various departments.

Dr. Carl F. Taeusch, representing Dr. M. L. Wilson, the Under Secretary of Agriculture and the incoming president of the Agricultural History Society, discussed briefly the forthcoming celebration of the seventy-fifth anniversary of the creation of the Department of Agriculture in September.

Dr. Frederick L. Lewton of the Smithsonian Institution discussed the past and present status of the agricultural history exhibits at the National Museum. He also told of an interesting personal experience with the fake cotton gin, now being exhibited in Massachusetts as the "first" Whitney gin.

The auditing committee, consisting of Miss Cora L. Feldkamp and Mr. T. R. Stanton of the U. S. Department of Agriculture, and Mr. O. A. Juve of the U. S. Tariff Commission, approved the report of the secretary-treasurer for the fiscal year April 16, 1936 to April 1, 1937.

SCIENCE IN THE SOUTH

Thomas Cary Johnson, Jr., in his *Scientific Interests in the Old South* (University of Virginia, Institute for Research in the Social Sciences, Institute Monograph 23. New York, D. Appleton-Century Co., 1936. 217 p.) has provided us with a valuable and scholarly work on a hitherto much neglected subject. In the words of Professor Johnson, "A cardinal assumption of American historians is that in the States which in 1861 united to form the Confederacy there had been little intellectual activity of any kind, save that demanded by an agrarian economy and its political defense; and that what little there was, was exclusively devoted to the classics." There is still a persistent impression that the South has been indifferent to science and has made relatively few and unimportant contributions in this field. The two hundred and seventeen fully documented pages of this monograph are a complete refutation of this erroneous impression. As the author shows, Southern scientists "were doing some of their best work in the decade of the fifties," and, as a matter of fact, "between 1801 and 1861, the people of the Southern States in common with those of the North and of Western Europe were intensely interested in the exploration and mastery of the forces of nature." The author has also pointed out that "a society that could produce J. Lawrence Smith, the Rogers brothers, Bennet Dowler, the two Le Contes, Maury, Audubon, H. W. Ravenel, F. S. Holmes, Holbrook, and Hardy Bryan Croom was not dead to the natural sciences." To these illustrious names, he has added many other Southerners who distinguished themselves in science and invention during the antebellum period and in later times, as, for example, Lewis and Clark and John C. Fremont in exploration, John Clayton and John Mitchell in botany, Rumsey, McCormick, Lyons, Henry, and Draper in invention, Tuomey and Elisha Mitchell in geology, Mallet in chemistry, Ruffin in agricultural science, and Wells in the theory of evolution by natural selection (antedating Darwin in this respect). The volume very clearly indicates that the traditions of the earlier years have been maintained and that the South's contributions to science have continued to be notable and creditable.

Professor Johnson's monograph is a mine of exact and timely information regarding a relatively unknown and persistently misrepresented aspect of Southern history.—W. H. Beal.

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HISTORICAL ASPECTS OF AGRICULTURAL ADJUSTMENT

THE HISTORICAL APPROACH TO THE ECONOMIC PROBLEMS OF AGRICULTURE[1]

H. C. TAYLOR
FARM FOUNDATION

This program dealing with agricultural history is important not so much because it calls attention to the interest and the importance of that part of our national history which relates to the changes in agricultural production and modes of life of farm people, as because of the importance of the historical method of approach in the study of the economic problems of agriculture. I have noted through the years that those students of agricultural economics who have confined themselves largely to the use of the deductive method have arrived at conclusions quite out of line with the practical thinking of the times. The theoretical approach is useful in providing working hypotheses as a starting point in research. If these hypotheses are looked upon as conclusions, research is dead; but if looked upon as a starting point in the use of fact gathering and fact analyzing methods, they can be invaluable. Likewise, those students who have specialized in the statistical method have often failed at well-balanced conclusions. The statistical method is invaluable for the contribution it is capable of making, but as a rule, it can bring into the picture only a part of the facts.

Farm accountancy has made very important contributions, not only by providing a certain amount of statistical material, but by giving the fact basis for a much closer analysis of the details of farming activities and their inter-relations. But, agriculture is not a static thing; it is ever changing, and for this reason, an analysis which gives a clear picture of the type of farming that pays best at a given time and place is not in itself a trustworthy basis of deciding what we should do in the future years.

The historical method is invaluable because it brings a dynamic point of view to bear upon the materials with which the accountant, the statistician, and the logician may be working; furthermore, historical study helps the student of agricultural economics to appreciate the many subtle forces which may be at work at any given time, which are not subject to analysis by the account-

[1] Statement made at the opening of the Joint Session on Agricultural History at the Twenty-seventh Annual Meeting of the American Farm Economic Association, Chicago, Illinois, December 28, 1936.

ant or the statistician, and which have been usually overlooked by the logician while formulating his hypothesis.

Every agricultural economist should be a student of agricultural history. It will be wise, of course, to have specialists devoting themselves to research work in this field in order to make new contributions to the subject, but every agricultural economist should familiarize himself with the well-known facts of agricultural history. Research upon any particular topic such as the problems of tenancy and land ownership, problems relating to the choice of farm enterprise in a given area at a given time, and problems relating to the marketing of farm products, should always include the contributions obtainable by the use of the historical method as well as the accounting, the statistical, and the logical methods. It is not safe to depend upon any one method if the research worker would arrive at dependable conclusions.

I am convinced that we have given relatively too much attention to accountancy and statistics, and too little attention to the historical method, in studying our various farm economic problems. It was with the hope that special emphasis might be given to the importance of the historical method that I suggested to the president of the American Farm Economic Association the importance of having a session upon this subject on this occasion.

No student of agricultural economics should be without a clear picture of the progress of American agriculture from colonial days to the present time. He should know the kind of soil the Colonists found when they arrived in New England and in Virginia; the kind of implements they used in tilling the soil; the kind of plants they produced; the effect of the potential farm enterprises upon the type of agriculture that developed; the westward movement of farmers; the expansion of wheat growing; the westward movement of the sheep and cattle industry; the expansion of the cotton belt; and the changes that were wrought upon agriculture in the eastern part of the United States, and in Europe, as the Mississippi Valley and the western plains were brought under cultivation and the products commenced to flow over a network of railways into the markets of the world.

It is important also to know the history of the national economic policies used to develop the "home markets" and the ultimate effect of these policies upon the farmer's foreign markets. Not only should every student of agricultural economics have this general historical picture clearly in the background of his mind while taking up any piece of agricultural economic research,

but he should study the special phases of history which relate to the particular problem with which he is dealing.

In the light of the historical setting, the accounting and statistical materials will possess their greatest value, and the generalizations drawn may be of greatest value.

A CENTURY OF ADJUSTMENTS IN A NEW HAMPSHIRE BACK AREA[1]

H. C. Woodworth
University of New Hampshire

This paper undertakes to present a study of a back country area in which agriculture has declined for many years until it has now almost disappeared. The first section briefly relates to adjustments from 1800 to date, the middle part to a description of present conditions, and the last to certain aspects of future adjustments.

In the land-utilization study for which the data were collected, the New Hampshire Agricultural Experiment Station has emphasized a description of present problems in this area with a view to the formation of state land policies. The historical aspects have received attention only incidentally, but they become intriguing as one works on the problems involved in this back area of an old settled country.

The area under consideration is located in western New Hampshire in southern Grafton County and has been declining in agricultural importance and in population for nearly a hundred years. Adjustments are still in process. A present land-use map of the state indicates many areas in which no commercial agriculture appears. Some of these areas, such as the large one in the north, are mountainous and were never cleared and settled. Other sections were once thickly populated and farmed, but have declined greatly in population and farming activity since the Civil War. Such an area is the rather large space in southern Grafton County, back from the Connecticut River and comprising portions of fourteen towns. Data taken from H. F. Walling's map printed in 1860 indicate the roads and location of farmsteads at that time. The roads pierced nearly every section, and farmsteads were fairly evenly distributed. Only rough mountainous areas were untouched. Abandonment of certain locations had begun as early as 1840, and probably the roads and farm-

[1] This paper was read at the Twenty-seventh Annual Meeting of the American Farm Economic Association, Chicago, Illinois, December 28, 1936, in Joint Session with the Agricultural History Society.

steads were at that time even more extensive than shown on the map. Professor Goldthwait of Dartmouth College states that he has found 28 cellar holes in Lyme not indicated on the Walling map.[2]

A comparison with the present agricultural map indicates that this interior upland has suffered more severe declines in farming activity than the region in or near the valleys. The area as delimited contains approximately 175,000 acres or 273 square miles.

On the whole the terrain is rather rough and bold. Within the area are Mount Cardigan, 3,121 ft. elevation; Mount Cube, 2,914 elevation; Smarts Mountain, 3,240 elevation, and several lesser mountain ridges. There are a few small level intervales at about 1,000 ft. elevation but most of the fields and former fields are on the tops or sides of ridges or on broken upland. Rocks except on the intervales are numerous and impede cultivation.

The soil is variable as in most parts of the state. Fine sandy loams, stony loams, stony rough land, and soils too wet for hoed crops may be found. In general many of the tillage fields are good loams and are capable of supporting good yields if managed with livestock and lime. They are difficult to work with modern machinery and depreciate rapidly if not well managed. Some of the abandoned roads lead up the mountain sides to former locations where the fields must have been very small and difficult to work. The occasional farm which has been operated aggressively with a full stock of cattle has good yields at the present time.

Soldiers passing through in the Indian Wars of 1760 had taken an interest in the possibilities of the region. Some of these returned as settlers within the next few years. By 1772 the interior was well settled. For the next 30 years the clearing of land and establishment of homes were pushed with vigor. The first development was a self-sufficing agriculture, but as more tillage land and pasture became available on some farms, additional products were raised for sale. Many farms never developed beyond the self-sufficing stage, and some of these were not occupied for more than 30 or 40 years. Fat cattle represented the principal enterprise in the early 1800's, but beginning about 1828 the sheep industry developed rapidly. In 1834 production in the area was probably at its peak. Land clearing had been

[2] J. W. Goldthwait, "A Town that Has Gone Downhill," *Geographical Review*, 17:527 (October, 1927).

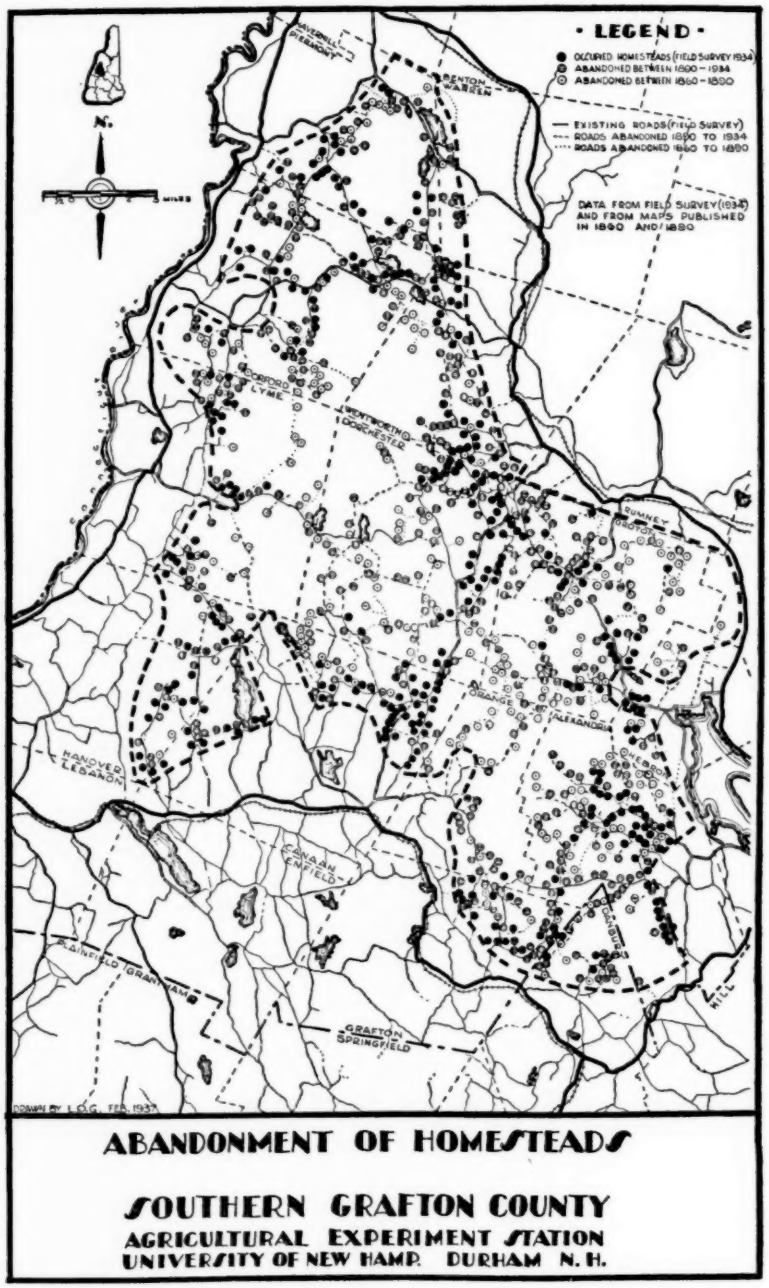
extended, and cattle and sheep farming were established to the limit of the land resources. The better soils were still fertile, and crop yields were good. The trend of conditions in back areas is difficult to trace from this point on because many towns comprise intervale lands that persisted in agricultural use as well as back uplands that were abandoned. Total data or averages such as census reports fail to describe either situation. Industrial developments in some of the villages resulted in rapid expansion of population and creation of markets which obscured the situation in other parts of the town.[3]

In the earliest times the advantage in location was not great. Self-sufficing agriculture and the work of clearing meant that most activities were centered on the farm, and trips to market were infrequent. It is said that the hills were settled and cleared first because the clearing was easier and the location was preferred for safety. But as agriculture advanced to a stage where some operators were able to sell products and as local centers in the valley became trading posts, the location of the farm and the quality of the land became more important. With the completion of the fourth New Hampshire turnpike from Boscawen to Lebanon in 1804, the Grafton turnpike from Andover to Orford in 1811, the interior upland was placed at a disadvantage. The extension of the railroads up the valleys on both sides of the area in the period 1847 to 1853 gave the valley farms more satisfactory access to the expanding markets in factory towns of Massachusetts.

Later on, competition with the standard products of the developing West brought hardship to the agriculture of the region, but the valley farms were able to take advantage of the nearby markets. Technological developments of agricultural production placed the hill farm with small rocky fields at a tremendous disadvantage.

A comparison of the location of roads and occupied places in 1860, 1892, and 1934 reveals the trend and location of abandonment. Only 291 of the 916 locations existing in 1860 were occupied by year-round residents in 1934. Using the population-to-farm ratio in Groton as a base it is estimated that the population in the area was approximately 4,700 in 1860 as compared to 883 in 1934. It is further estimated that at the peak of the livestock population, the area supported 5,500 cattle over 18 months old

[3] Edward N. Torbert, "The Evolution of Land Utilization in Lebanon, New Hampshire," *Geographical Review*, 25:209 (April, 1935).
Harold F. Wilson, *The Hill Country of Northern New England* (New York, 1936).



Of the 916 homestead locations in 1860 only 291 were occupied in 1934.
(Summer homes not included)

and 21,068 sheep over 6 months as compared to 957 cattle and 167 sheep of similar ages in 1934.

In surveying the forest cover in some detail in the town of Dorchester, Mr. Carl Walker was able to map the areas of land which had been originally cleared in comparison with present land-use.[4] This indicates 43 percent cleared about 1860 as compared to 13 percent in 1934. Forest growth is the natural climax in New England and has taken over the land to a large extent. The old cellar holes, the lilacs and rose bushes, the stone walls, the old mill sites, the small cemeteries are mute evidences of the former habitation. This recession of agriculture is illustrated in the data taken from town inventories: for Dorchester from 1801 to 1936, and for Groton from 1834 to 1936. These two towns were chosen for this purpose because the records were available and because both towns lie very largely within the area studied.

The Dorchester inventory shows that six farms had developed beyond the self-sufficing stage as early as 1801, having over 10 animals of the cattle kind. Sheep do not appear on the town inventory in 1801, 1810, and in 1820, and probably none were present. In 1830 the inventory reveals only one flock of sheep —90 head, but by 1840 the sheep industry had developed amazingly. In that year the inventories indicate 2,917 in Dorchester and 2,887 in Groton. This is one instance in which the New England farmer forgot his conservatism and followed a "boom" due to the high wool prices and the general sheep craze. One might easily conclude that all the farmers had taken up the sheep industry, but the inventories indicate that some men held on to cattle.

It is suggested by several writers that lands were cleared rapidly for pastures between 1830 and 1840 and also that clearings on the few abandoned farms were reoccupied. At the very peak of livestock population probably the pastures were overgrazed. The farmers were utilizing a sort of flush period that exists for the few years when the fertility in the forest humus is first set free.

Reduced pasturage and the falling prices of wool brought reduction in sheep numbers. Some operators went out of sheep quickly, and others maintained large flocks even as late as 1890. Evidently individuals, in the light of their peculiar resources, farms, skills, and interests, reacted differently to the changing economic situation.

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[4] Mr. Carl Walker, graduate forester, by noting stone walls, tree growth, etc., was able to determine areas which had been cleared.

At various periods in the last hundred years opportunity for labor off the farm has had an influence on the agriculture of the area. For instance, in Dorchester on the Mascoma River from Reservoir Pond to the town line, an area now completely abandoned, the forester reports evidences of six mill sites. No doubt people from local farms had a part in harvesting and milling of timber resources. This local timber industry probably began about 1830 and intermittently has continued until the present. Later on, probably about 1885, mining of mica and feldspar in several sections of the area furnished employment to local farm people and brought in new families.

We have at hand no quantitative data as to the extent of the timber or mining influence in this area in drawing people away from agriculture, but in other sections of the state the development of factories has had a profound influence on the agriculture and the people.[5]

No doubt these opportunities for work off the farm had a different appeal to men in different circumstances. The man at the end of a mountain road with small fields and little resources could well afford to work for wages. When this work ceased locally, he would be quite ready to follow the job to some other location in preference to returning to his small unproductive farm. The assumption is common that in a declining agriculture the more resourceful and abler people get out first. I have the impression that at certain periods the less resourceful were attracted away from the local farms, and that at other times the ablest sought better opportunities elsewhere. I feel quite certain that abandonment of land according to productivity and the migration of people according to ability have not been as "liquid" as some theorists have supposed.

The impact of this migration of young people might not register fully upon the agriculture for a number of years. The movement was probably not due entirely to changes or to discouragement in the local agricultural situation. The developing industrial system, the building of railroads, and the conquest and settlement of the West beckoned attractively to young men of all classes.

The rapid decline in agriculture after 1860 was accompanied by migration of families into as well as out of the area. This change in personnel was probably part of the adjustment process. The movement both contributed to the decline and resulted

[5] Harry C. Woodworth, "Nute Ridge," New Hampshire, University Extension Service, Extension Circular 68, April, 1927.

from it. New families with different resources and capacities were responsible for shifting proportions of labor, capital, and land.

Very few of the present resident are descendants of the original settlers. Of the 85 surnames in the 1840 inventory for Dorchester only Carr, Burley, Eastman, and Smith remain, and this particular Smith is not native to the region. Of the 90 names for Groton only Butterfield, Albert, Bartlett, and Mathew remain.

The present list of operators represents a wide variation in experience and capacity. With a few exceptions their capital resources are meager, and on the whole their inherent capacities are not fully utilized. The blight of decline has come so gradually and insidiously that men's opportunities vanish without their knowing it. After a time a sense of some security even on a very low level is preferred to new adjustments elsewhere coupled with great uncertainty. In age, roughly, one-third of the operators are under 40, another third are over 60.

A description of the present income of the people in the area indicates that the nonfarm activities have grown in importance and reveals a new adjustment of people to their situation.

A summary of 255 records which include practically all actual farms in the area shows a gross income from sales of agricultural nonforest products for 1934 of $73,486. Thus, an area comprising about 3½ percent of the acreage of New Hampshire accounts for only one half of one percent of the state's commercial production. Sales of forestry products from these occupied farms amounted to $17,251.

Against this total gross cash income from sale of farm and forest products of approximately $91,000 must be considered cash farm expenses for grain, taxes, etc., of about $106,000. The deficit between cash receipts and cash expenses, amounting to $15,000, together with the funds needed for living expenses, is made up from other nonfarm receipts of $95,336—over half of the total cash receipts. This indicates the extent to which the farm operators in these back areas are dependent upon work off the farm and on outside income.

This situation in which the people in a rural community receive a considerable part of their cash income from sources not directly related to the farm is characteristic of New England. Near industrial centers the occupants of farms or members of their families commute to jobs in the city. A pattern of commercial and small part-time farms often occurs even in the more intensive agricultural areas.

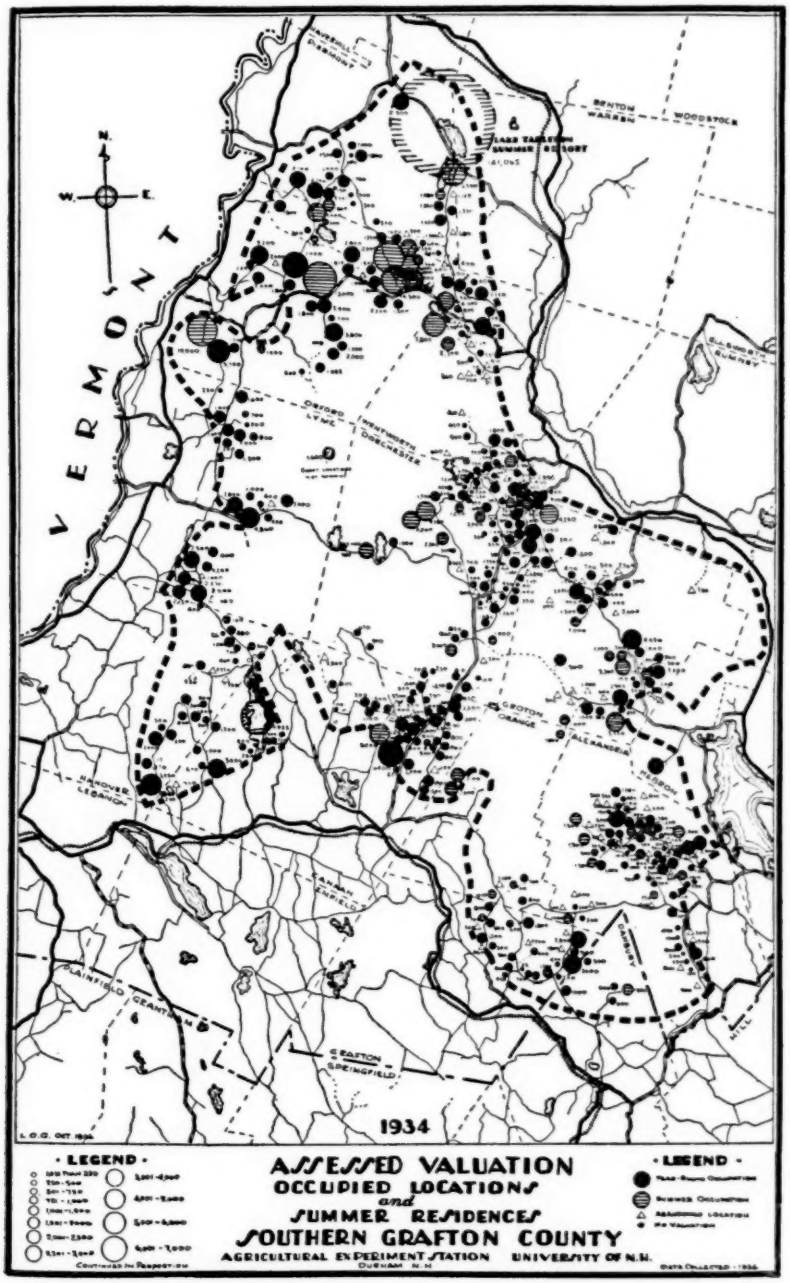
The important difference in these back areas and the more densely settled regions is that in the back areas the total income is very low, and the source of much of the income not associated with farm activities is temporary and socially unproductive. Of the $95,000 received from nonfarm sources $22,417 represents income not related to the location in the area, to the operator's labor, or to the present resources of the land. This consists of gifts from relatives, pensions, withdrawal of savings, insurance, and relief. These sums would be available to the individual if the family moved elsewhere. Of the $73,919 received for labor off the farm a considerable amount was for the building of state-aid roads, construction and maintenance of town roads, snow removal, town offices, and transportation of children. The dependence on income from local tax sources varies greatly with different parts of the area and with individuals. It results from maladjustment of people and institutions to land.

As an extreme case, it might be said of one town without much exaggeration that the chief activity of the local people is centered on constructing and maintaining highways. The roads are expensive to build and costly to maintain on account of grades and hills. The people have abandoned farming and remain to build the roads. They are not usually conscious of the unsocial and unproductive side of the ledger. They have grown up with the situation and most of them work honestly and conscientiously, if not vigorously, for their town.

It is difficult to determine to what extent this is socially unproductive. Roads do facilitate forest management and harvesting. Isolated families do need roads for communication to schools, church, friends, markets, and access to road-building jobs. What kind of road and how much road for forestry purposes are debatable questions. If people are to remain, these roads need to be better than they are. Over a long period it may be a choice between more road and very meager living on the one hand and less road and more abundant living on the other. Local resources can, however, support only about so much.

There has been a radical change in the tax base. With the decline of agriculture and the accompanying shifts in values the occupied places have become less important in the town inventories. In 1840 local residents of Groton paid over 98 percent of the taxes, and this situation was probably typical of the area.

In 1934 the occupied places represented only 14 percent of the total assessed valuation of the entire area. A large proportion of the value of occupied farms is concerned with timberland and represents a resource that is not materially changed by further



The assessed valuation of occupied locations and summer residences by location indicates many low-value farms. Some of these are isolated and require considerable road mileage per $1000 valuation.

abandonment of agriculture. Summer occupancy, abandoned farms, wild lands, and electric transmission power lines are the present important assets in town inventories.

It is interesting to note that in 1834, with all the activity in Groton, the large sum of $830.72 was submitted to the tax collectors. Even as late as 1910 only $3,609 was submitted. For several years now it has been over $15,000. The building of about nine miles of power lines added $173,000 to the town inventory. The tax may be a burden to some interests, but it is a source of income to the local residents.

One cannot endorse the situation from the viewpoint of efficiency in government, and yet the approach to the solution of the problem should be broader than merely a drive for such efficiency. The inefficiencies and misdirected efforts are the result of serious maladjustment. An effective solution will require that an attack be made on the fundamental problem—the adjustment of people and institutions to land.

Of the 255 farms where detailed records are available, 118 or 46 percent sold less than $50 worth of agricultural products, and only 19 or eight percent sold over $1,000 worth. In this latter group of 19 farms the specialized poultry enterprise was most important on three farms. In certain areas of the state, poultry has replaced cattle on farms where tillage is difficult, and this adjustment has checked abandonment; but in the area we are considering there is only a trace of this change. The poultry enterprise is not very definitely related to the use of tillage land. On specialized poultry farms in New Hampshire, all grain is purchased and only a small area of tillage land is used for range in growing pullets.

Since the availability of sites is not the limiting factor in the development of the poultry industry, the problem is one of relating poultry to the best sites. The permanent presence of poultry enterprises in problem areas can be considered quite apart from the crop and livestock farms and given a different emphasis. They may well be encouraged wherever other factors or other poultry enterprises indicate good possibility of the community's permanent continuance.

It is interesting to consider in some detail the 118 farms with less than $50 in sales of agricultural products. The average farm organization of this group can be briefly described as: 57 acres of woodland and pasture and 17 acres of tillage, 1 cow, ½ heifer, ½ horse, 8 hens and .4 pigs. The average value of farms is $914 and the total investment is $1,083.

The total gross income from farm sales and labor off the farm

averaged $315 per farm and consisted of: $20.10 sales of agricultural products, $9.82 sales for forest products, and $285.52 work off the farm.

The expenses in connection with the farms averaged $158, leaving approximately $157 for interest, debts, and living expenses. In addition, an average of $83.46 was drawn on in the form of gifts, savings, and relief. Products used from the farm averaged $148.

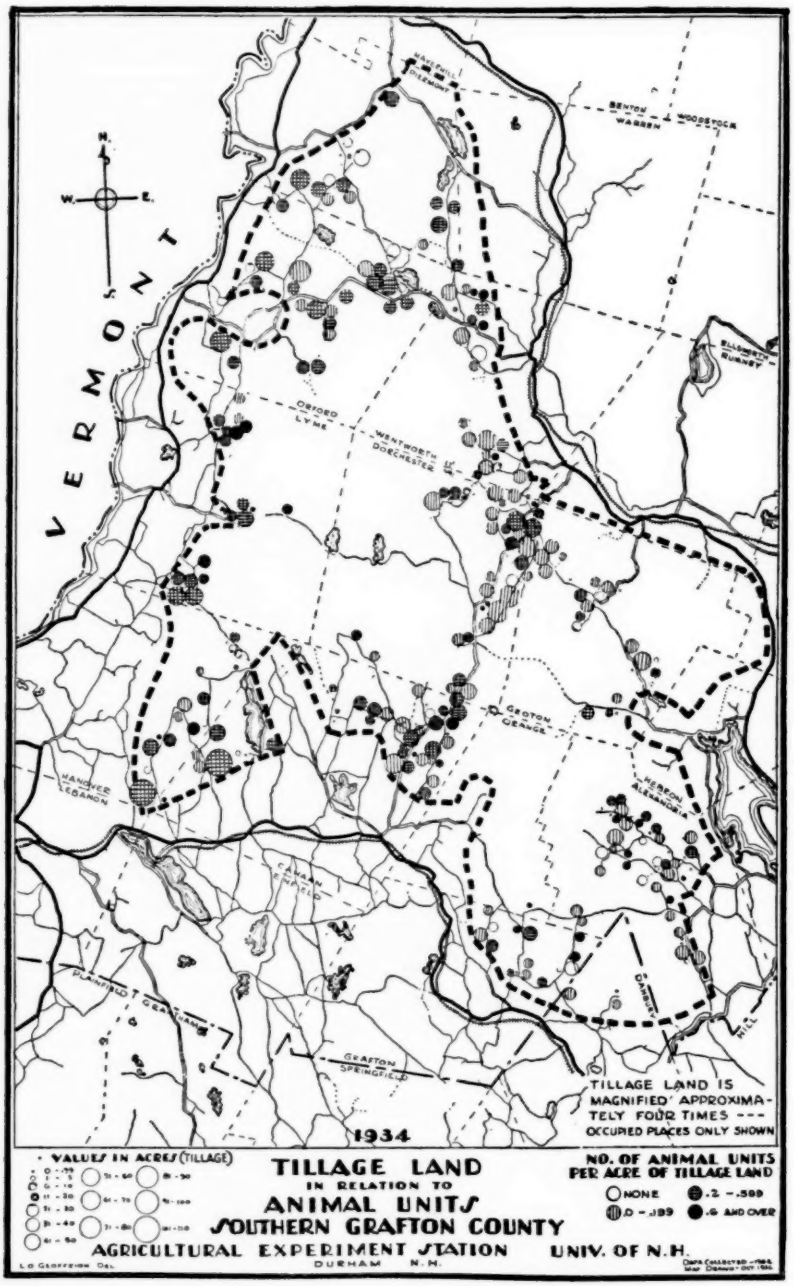
The distribution of individual farms by sales of agricultural products and by total net earned income describes the status of the individual families and gives a better picture of the situation in the region as a whole. These data were, it is true, collected in the midst of the depression, but the status of this group will not be materially improved in prosperous periods. The operators are without the organization and facilities for commercial production of agricultural products. Their timber lots are fairly well culled over, and the opportunity to sell their labor to advantage in this location is not encouraging under present ownership and management of forestry lands.

The relative size of the farm organization on the individual location is further described in terms of the number of days normally required to handle the acres of crops and number of livestock. On this basis the average farm organization represented 74 man work day units, or somewhat less than one-third of a full one-man farm. Twenty-six had over 200 man work units and might be considered as one-man farms. Seventy-eight of the farms had less than 50 man work units and can be regarded as rural residences.

We have followed the adjustments in this area for a hundred years and described briefly the present situation. What of the future? The trend line in agriculture and population has been quite definite for 75 or more years.

1. From the viewpoint of an aggressive commercial agriculture, an agriculture in which men are encouraged by expectation of profits to develop productive farms and build fine herds, most of the farms are not important.

Observation of New Hampshire agriculture leads to the conclusion that most of the tillage fields can be maintained only if associated with livestock. Of the 6,414 acres of tillage land reported in this area 49 percent is associated with less than 0.2 animal units per acre. This tillage land is probably declining in fertility, and one can predict that if present management continues it will be in brush by 1955. It is further estimated that present management results in the maintenance of 44 per-



Under present management approximately half the tillage land is declining in productive capacity and will probably be in brush in less than 20 years.

cent of the tillage land at about present low levels of production and in the improvement of yielding capacity of only 7 percent.

2. On the other hand, our thinking as related to farm economy has been built around the man in the prime of life who can aggressively push productive activities through long hours, if necessary. Unfortunately we do grow old, and can no longer furnish the motive power for such a farm. Many small farms in New Hampshire are the havens of the older men from city and country, both rich and poor. What will be the future trend in migration from the cities and from other rural sections of different classes and ages of people who love the country?

Farms located along main roads in a persisting community are useful and attractive for this purpose even though they have little importance commercially. The problem here is more one of consideration of individual preference and social costs in maintaining the services in roads, schools, and medical care.

3. Forestry is the chief resource of the area, and future adjustments depend greatly on the trend in public and private policy toward the development and management of forest resources on a sustained yield basis. Starting in 1937 with depleted and culled stands and ownership by private corporations and individuals, the ratio of employed population to acres of land is likely to be very low. Under present conditions of management and intensity of land-use there are too many people in the area, and some of them should migrate whenever other opportunities prevail. There seems no immediate possibility of management of the resources as a basis for continuous employment for the capable workers within the area.

Some degree of intensity of management would be socially desirable. Even under very extensive management, labor will be required in logging and trucking, and such labor could be adjusted to the life of the community. This 175,000 acres of land could furnish productive work for a portion of the able bodied men. There could develop a pattern of small part-time farms grouped along the main highways in a commercial forest area. This is a possibility under public ownership or some form of directed or controlled private ownership. We need a positive program of relating population to forest and other resources of the area. Without this positive program of relating people to the forest resources, the local inhabitants are always in an unstable and precarious position.

A few farmers, in addition to their small farming operations,

harvest and mill timber from their woodlots, and this is an adjustment not previously mentioned. This may well be encouraged but there is little expectation of any particular development in this direction.

4. Summer occupancy is another possibility that may have a marked effect on developments in certain portions of the area. Already the summer sites more than equal occupied farms in value. While much of the timber is culled over, in few instances is the land stripped. The general view from many angles is pleasing. Mt. Cardigan, Mt. Cube, the several attractive small lakes, and the generally bold topography offer something to city people. There has been a steady absorption of abandoned or nearly abandoned farms by middle-class city people for summer homes in many parts of the state. We have no basis upon which to predict the future trend of this movement. Are there possibilities of acceleration of movement of certain income groups to desire and seek summer residences? Still more difficult to predict is the development of estates by the well-to-do.

Since the field records were taken in 1934, there has been some development in the back end of the town of Alexandria. Several abandoned homes have been reconditioned. The CCC has built ski trails, and the Appalachian Mountain Club has established quarters. If these developments continue, there opens a possibility of a summer and winter recreational, forestry, part-time farm pattern of occupation that may persist indefinitely.

5. The situation has been developing for a hundred years or more, and we should not expect to solve the problem overnight. The near abandonment of the area has come about through the decisions of hundreds of individuals over the years. Rugged individualism brought men out of the area and into other adjustments elsewhere. It would be interesting to trace the people and their descendants. I have the feeling that most of them did not make a mistake in migrating and that the Nation gained from the realignment.

But this same rugged individualism was responsible for other families getting caught in a trap from which they cannot easily escape and even then perhaps only through the sale of the farm to a new victim. This is too great a social cost and we must help people to work themselves out of it. To the few who would regiment people back into the area to rejuvenate the agriculture, one might suggest the reading of accounts of the hardships and discontent of the population from 1850 on.[6]

[6] Harold F. Wilson, *The Hill Country of Northern New England.*

To those who would bring a people back into an area on the basis of a self-sufficing agriculture, a statement by Walter E. Elliott, Minister of Agriculture and Fisheries of England, to a similar problem seems a worthy answer.

"If we were planning for a complete breakdown of an economic system or for another great war or some other variety of chaos, the safest thing to do would be for all of us to take up our little bits of land and delve and spin like Adam and Eve. Most of us, I should think have still enough of the cultivator's instinct to keep ourselves from starvation. But I think it is wise and better to plan for prosperity than for ruin."

On the other hand while a self-sufficing way of life may be a step backwards, certain individuals or certain groups find themselves unable to make the necessary readjustments to a commercial life and they should not be denied the opportunities of a self-sufficing mode of living providing they choose locations where the social costs in roads and schools are not prohibitive.

By education and discussion I believe the land can be rated by priorities for different uses and the more serious maladjustments taken up first. This may require such directional measures as zoning and assistance to certain badly located families in relocation at their desire. It may include positive steps in the development of summer sites by making the good sites more easily available. The greatest need is to relate people to the forest resources, and perhaps this may require public ownership and management or public control of the wild lands.

THE DEPRESSION OF 1873-79[1]

O. V. Wells[2]
Agricultural Adjustment Administration

I

As economists we analyze the past in order to forecast the future, or at least as an aid in understanding the present. The simplest analysis of this sort is to consider some period in the past as similar to the current period and to infer that the same general sequence or pattern of events as appeared in the past will be repeated in the present.

[1] This paper was read at the Twenty-seventh Annual Meeting of the American Farm Economic Association in joint session with the Agricultural History Society at Chicago, Illinois, December 28, 1936.

[2] Acknowledgement is due Mr. James P. Cavin of the Program Planning Division, Agricultural Adjustment Administration, for assistance in collecting and analyzing the material here presented, especially in connection with Section II. The author first worked on the subject here discussed at the suggestion of Dr. Edwin F. Gay, while a student at Harvard University in 1931-32.

An example of this line of reasoning or method is to be found in the not uncommon comparison of the behavior of wholesale prices in the United States following the close of the Civil War with the situation following the close of the World War.[3] And it is with a significant portion of this period following the Civil War, the period of general depression which began in 1873 and extended into 1879 or early 1880, with which I want to deal. That is, how was American agriculture affected by the depression in the period 1873 to 1880? And to what extent was the situation of agriculture in the recent depression which began in 1929 similar or dissimilar to that existing in 1873?

II

After the Civil War drew to a close in 1865, wholesale prices in the United States entered upon a long decline which merged after 1873 with a world-wide decline that continued until about 1896. The pressure of a gradually falling price level, however, did not prevent the United States from enjoying a fair degree of prosperity in the years 1868-73. The output of physical goods moved steadily upward, agricultural reconstruction went forward in the South, agricultural exports increased, railway mileage almost doubled, and the number of immigrants reached a new high level. For the money market, however, the whole period was characterized by high interest rates and recurrent periods of stringency, especially in the fall.

This upward movement came to an abrupt halt at the end of the summer of 1873, as the banking community discovered that it had reached a saturation point in the flotation of new securities and that the railroad system was overbuilt. The crisis was precipitated on September 18 by the failure of the well-known firm of Jay Cooke & Co., which had over-extended to the Northern Pacific Railroad. Nineteen other houses failed on September 19, security prices collapsed, and the New York Stock Exchange closed on September 20. As the panic spread, currency payments were suspended, clearing house certificates were issued, and credit became difficult or impossible to obtain.[4]

[3] See Figures 5, 6, and 8 in the discussion of business conditions by G. F. Warren and F. A. Pearson contained in FARM ECONOMICS, No. 69, February, 1931, and Figure 31 in Section II of "General Conditions and Tendencies Influencing the Nation's Land Requirements," Part I of the Supplementary Report of the Land Planning Committee to the National Resources Board, Washington, D.C., 1936. The caption under the National Resources Board chart reads: "So far, the postwar decline in prices of farm products has duplicated in large measure the decline of agricultural prices after 1864. If this parallelism continues, higher prices for the full year 1935 would seem likely with some noticeable decline after 1936. . . ."

[4] This account is based on Persons, Tuttle, and Frickey, "Business and Financial Conditions Following the Civil War in the United States," *Review of Economic Statistics*, Preliminary Volume 2, Supplement 2, July, 1920. Some interesting comments also are to be found in Wells, D. A., "Recent Economic Changes," New York, 1895, Chapter I.

This crisis in the United States soon communicated itself abroad, where the end of the promotion mania which had swept Central and Eastern Europe during the preceding three or four years already had been signalled by a panic on the Vienna bourse, which had spread to Germany, and to a lesser extent, to France and England. The European reaction to the American crisis was violent. Panic again broke out in Vienna and Berlin, and the discount rate of the Bank of England was raised to 9 percent.[5]

These monetary crises in the fall of 1873 were followed by a world-wide depression which lasted almost until the end of the decade, and by a gradual but equally widespread fall in prices, which (after some recovery in 1880-82) continued until 1896. There was, at the time, the usual disagreement as to the causes of the depression and the remedies which should be applied. At least 180 different causes were advanced by witnesses appearing before Congressional committees which investigated the causes of the depression in the United States. The Dutch found that the fall in the price of German vinegar was an important contributing cause, while excessive speculation, the falling off in the production of wine, and the disappearance of fish from the coast of Brittany were among the causes advanced by the French. In 1885, a British Royal Commission succeeded in reducing the major causes to six, one of which was overproduction. And it is interesting to note that the Oxford Prize Essayist for 1879 already had found the "real and deep-seated cause" in the fact that "the whole world is consuming more than it has produced."[6]

In retrospect, it appears that the crises were largely traceable to the financial excesses which had characterized the five or six years preceding 1873. Governments and individuals borrowed to finance undertakings of almost every sort, especially railroad construction. The United States, Turkey, Egypt, and South America were supplied with funds from England, which loaned over 1.5 billion dollars in the brief period 1870-74, while Russia, Austria, and Italy were supplied chiefly by Germany, to whom France paid a war indemnity of five billion gold francs between 1871 and 1873.

With the first scare, both stock and commodity prices fell, bonds went into default, over-extended bankers failed, and credit began to contract. This cyclical recession was, in turn, drawn out and over-emphasized by a decline in wholesale prices brought

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[5] For the chronology of the crisis, see Thorp, W. L., Business Annals, New York, 1926, and Clapham, J. H., "An Economic History of Modern Britain," Volume 2, pp. 379-83.

[6] For contemporary opinions of the causes of the depression, see Wells, *op. cit.*, pp. 19-26.

about by a continued increase in both agricultural and industrial production, and by a relative decline in the production of gold, accompanied by special demands for gold as France took steps to increase her reserves and Germany and the United States went on a gold standard. As Clapham indicates, "... The after effects of the crises of 1873 were naturally confused with the early stages of the commodity price fall ... which began among them but was not in any true sense their consequence. A fall from the level of 1872-73 was inevitable and was anticipated; but a ten-year fall, which grew into a twenty-year fall, was outside the experience of the generation which had to bear it."[7]

Actually, although both agricultural and nonagricultural prices trended downward from 1873 to 1879, and although domestic bank clearings and interest rates averaged only about two-thirds of the predepression level, commerce, industry and agriculture in the United States were by no means in as depressed a state as is often supposed. Manufacturing output was maintained at about the same level, while mineral production increased slightly and agricultural production averaged 20 percent higher than in 1873. Even though the prices of railroad stocks were cut in half between 1872 and 1877,[8] and almost 800 million dollars of railroad bonds were in default in 1875,[9] the construction of new mileage continued at about 35 percent of the high annual rate which was set in 1870-72.[10] And finally, the average annual value of exports increased from slightly under the 400 million dollars in 1868-73 to over 600 million dollars in 1874-78, while imports remained stationary at about 500 million dollars, so that our international balance of trade was changed and the Treasury was able to resume specie payments on January 1, 1879.[11]

III

The combination of available land with the rapidly growing population, the westward expansion of the railroads, and the improvement in agricultural machinery which the war had stimulated was forcing a rapid expansion in agricultural acreage

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[7] Quotation from Clapham, *op. cit.*, p. 383. This and the preceding paragraph are based on Jenks, L. H., "The Migration of British Capital to 1875," New York, 1927; Feis, H., "Europe the World's Banker 1870-1914," New Haven, 1930; and Monroe, A. E., "The French Indemnity of 1871 and Its Effects," *Review of Economic Statistics*, Preliminary Volume I, October, 1919. The price fall of 1874-96 is succinctly described and analyzed in Layton, Sir W. T., and Crowther, G., "An Introduction to the Study of Prices," London, 1935, Chapter VIII.

[8] Matthews, A. M., "New York Bank Clearings and Stock Prices, 1866-1914," *Review of Economic Statistics*, Volume 8, October, 1926.

[9] Wells, *op. cit.*

[10] Partington, J. E., "Railroad Purchasing and the Business Cycle," Washington, 1929.

[11] Bullock, Williams, and Tucker, "The Balance of Trade of the United States," *Review of Economic Statistics*, Preliminary Volume I, July, 1919.

prior to 1873. If anything, the depression further accelerated this expansion, since both the number of farms and the acreage of improved land in farms increased 50 percent between 1870 and 1880, and crop production increased 50 percent between 1873 and 1879-80.[12]

Surprisingly enough, the domestic and foreign markets absorbed the resulting increases in production at prices which must be considered as good, in view of the prevailing financial depression and the downward trend in the general price level.[13]

Wheat acreage moved steadily westward across the prairies, and the production of wheat increased from about 250,000,000 bushels in the period 1870 to 1873 to 500,000,000 bushels, or just double the pre-depression level, in 1879-80.

Over the seven-year period from 1874 to 1880 the average farm price of wheat was 85 percent of the price reported for 1873, and the season price of spring wheat at Chicago actually averaged above the 1873 price in 1876, although the size of the two crops was not greatly different.

The price of wheat was supported during this period by an increasing domestic consumption due to the rapid growth in population, by an increase in the average level of exports from around 50,000,000 bushels in 1870-72 to almost 175,000,000 bushels in 1878-80, and by an abrupt drop of approximately 15 cents per bushel in the freight rate on wheat from Chicago to New York between 1873 and 1876.[14] This drop in freight rates is especially important when it is remembered that approximately 70 percent of our wheat production was accounted for by the North Central States during this period.

In the case of cotton, acreage and production were greatly reduced through the Civil War period and a normal level in terms of prewar production was not reached until about 1875. The average price of cotton at New York City in the 1875-76 season was slightly over 13 cents per pound as compared with 12.25 cents in the five years just preceding the war, 1856-57 to 1860-61, despite the fact that the depression had been under way since the fall of 1873. Cotton acreage increased 20 percent in the next three years, but the average spot price at New York City in the

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[12] Census of Agriculture, 1935, Volume I, Tables I and II; Persons, op. cit., Table 12; Timoshenko, V. P., "The Rate of Agricultural Fluctuations in the Business Cycle," University of Michigan Business Studies, Volume II, No. 9, June, 1930, Table I.

[13] Unless otherwise noted, the data in this section are based upon the series of special articles dealing with corn, wheat, cotton, and livestock which were published in the Yearbooks of the U. S. Department of Agriculture in 1921-23, and upon acreage, production, and price estimates as given in the Yearbook for 1927 and the Agricultural Statistics Report for 1936.

[14] As indicated by the rates quoted in the *Aldrich Report*, and by Figure 55 in the special article on wheat in the Yearbook of the U. S. Department of Agriculture, 1921.

1878-79 season, which was the lowest in the period, was only 10 percent under the price for 1875-76, while the price in 1880 was only 5 percent under the 1875 level, even though production was up 45 percent. Meanwhile, as acreage and production increased, exports moved sharply upward from an average of 2,400,000 running bales in 1870-72 to 3,800,000 bales in 1878-80.

Corn production was cut down by dry weather in both 1873 and 1874, and corn prices averaged almost 65 cents per bushel in 1874. But in 1875, when a 10 percent increase in acreage was accompanied by a 25 percent increase in yield, prices moved sharply downward to around the 35-cent level, where they remained through 1880. This price, however, was comparable to the price which had prevailed in 1872, while corn acreage increased 50 percent and corn production 500,000,000 bushels between 1870-72 and 1878-80. Almost all of the increase came in the North Central States, with the result that almost 73.5 percent of the corn was produced in these states in 1879 as compared with only about 57.5 percent in 1869.

The increased supplies of feed grains and hay were converted into livestock. Hog numbers, which were at a cyclical high in 1873, decreased into 1876 and then increased 35 percent to record a new high in 1879. But in six of the seven years following 1873, the reported per head value of swine on hand January 1 was above the value reported in 1873, and in the other year, 1879, the reported value was only 15 percent under 1873. Pork and lard exports steadily increased through the period, being equivalent to 1,665,000 average hogs in 1870-72, and to 7,200,000 head in 1878-80.[15]

The number of all cattle increased about 50 percent between 1870 and 1880. This marked increase in cattle was due to the increase in hay and feed supplies in the corn belt, to the continuing spread of range cattle from Texas northward, which followed the discovery that cattle could be wintered in the Great Plains Region without supplemental feed,[16] and to the fact that cattle prices, especially beef cattle prices, were not affected seriously by the depression. The farm price of beef cattle averaged $18.00 per head in the three years, 1872-74, and then dropped to only $16.50 per head in the period 1875 through 1880, despite the fall in the general price level and the fact that beef cattle

[15] See Thorne, G. B., and Richards, P., "Factors Affecting Exports of United States Hog Products," Bureau of Agricultural Economics, mimeograph, Washington, D.C., November, 1932, Figure I.

[16] See the special article on the Texas cattle situation in the Annual Report of the Commissioner of Agriculture for 1870, and Edward Everett Dale, "The Range Cattle Industry," University of Oklahoma Press, 1930.

numbers increased about 30 percent from 1872-74 into 1880.

Altogether, agricultural prices decreased about 30 percent at the same time that production was increasing 50 percent, but this decrease in agricultural prices was accompanied by a somewhat greater decrease in nonagricultural prices, with the prices of commodities other than farm products and food at wholesale declining slightly over 35 percent between 1873 and 1879, the year when prices reached their lowest level.

If the five years, 1856-60, preceding the Civil War are considered as a "normal" and agricultural and nonagricultural prices indexed on this base, a sharp rise from 100 to 189 for agricultural and to 202 for nonagricultural prices is indicated in the period 1861 to 1864.[17] The deflation which began in 1865 resulted in a reasonably gradual decline in both the prices of agricultural and nonagricultural commodities from a peak to a low point in 1878 to 1879, so that it actually was stretched over a fifteen-year period. Throughout this period agricultural prices fell somewhat slower than nonagricultural prices, with the exception that agricultural prices only leveled off in 1872 and 1873, while nonagricultural prices increased so that the relative purchasing power of agricultural products was depressed temporarily. The greater part of this relative loss was regained in 1874, however, and by 1879 both agricultural and nonagricultural prices had declined about 55 percent as compared with the peak reached in 1864. In the revival which followed, agricultural prices moved above nonagricultural prices as exports increased.

Farm income apparently increased about 15 percent from 1870 to 1880. This estimated increase in farm income is based upon the estimated increase in the gross value of nine crops and in the value of livestock slaughter. The estimated proportion of the national income going to agriculture, calculated on the basis of net income consumed, was 28 percent in both 1869 and 1879. Since both farm and total population increased 25 percent over the same period, the per capita income of the agricultural population was maintained at the same relative level as the per capita income of the nonagricultural population.[18] An additional

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[17] Based upon the Warren and Pearson Index as given in Warren, G. F., and Pearson, F. A., "Prices," New York, 1933, Table 3.

[18] These income estimates are based upon an estimated *national net income consumed* of about $5,485,000,000 and a comparable agricultural income of $1,535,000,000 in 1869, and a national net income of about $6,435,000,000 and a comparable agricultural income of $1,785,000,000 in 1879. These estimates are used through the courtesy of Mr. P. H. Bollinger of the Agricultural Industrial Relations Section, Agricultural Adjustment Administration. The nonfarm portion of the national income is based upon King, W. I., "Wealth and Income of the People of the United States," New York, 1915, Tables XXII and XXIII. Total population was 39,818,000 and estimated farm population 18,373,000 in 1870, while total population was 50,156,000 and estimated farm population 22,981,000 in 1880: Part I, Supplementary Report of the Land Planning Committee to the National Resources Board, *op. cit.*, Table VI.

income item which must not be overlooked is the increase in the value of farms and farm land through this same period. The average value of farm land per acre in 1880 was slightly over 4 percent higher than in 1870, and the value of all farm property increased slightly over 35 percent or from $8,945,000,000 in 1870 to $12,180,000,000 in 1880.[19]

IV

Almost all of our evidence indicates that agriculture fared about as well as could have been asked from 1873 into 1879, even though agricultural prices fell during this period and were undoubtedly very low in certain sections in years when very large crops were realized. As a check on this statistical evidence, however, certain comments by contemporary writers or others who have interested themselves in this period should be noted.

For the year 1875, the Chicago Board of Trade reported that the impact of the depression had been less severe in the Northwest than in other parts of the country, and that prices were renumerative and crops reasonably good. Extremely low agricultural prices were reported for 1878, but it was pointed out that purchasing power had been maintained through a parallel fall in the prices of things farmers needed. The development of the Northwest was described as "marvelous," and a rapid increase in population forecast.[20]

Hammond indicates that "for a decade and a half following 1876 cotton growers in the South were, generally speaking, in a fairly prosperous condition. A great increase in the demand for cotton took place in Europe, especially on the continent, and the demand was met in the main by American cotton. An even more rapid growth in manufactures took place in our own country, especially in the South where cotton mills multiplied rapidly after 1870."[21]

Buck, in discussing "fundamental conditions," indicates that farmers, especially mid-western farmers, were generally dissat-

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[19] This increase, however, was not evenly distributed. Along the Atlantic Coast, the acreage of farm land and the value of all farm property increased only about 10 percent through the period, and actual decreases in the value of all property were recorded for two states in this region, New Jersey and Vermont. In the East North Central States, acreage increased 20 percent and the value of all farm property 35 percent, and in the South Atlantic and East South Central States, where cotton was again gaining ground, acreage increased almost 15 percent and value over 30 percent. But in the Pacific, West South Central, and West North Central States, where expansion was most active, acreages increased approximately 55, 70, and 95 percent and values approximately 80, 120, and 90 percent, respectively, while in the sparsely settled Mountain States acreage increased slightly over 125 percent and the value of all farm property 525 percent. Calculated from acreage and value data as shown by the censuses for 1870 and 1880.

[20] Annual Report of the Trade and Commerce of Chicago, *Secretary's Review* for 1875 and 1878.

[21] As quoted in Schmidt & Ross, "Readings in the Economic History of American Agriculture," New York, 1925, Chapter 22.

isfied with their relative standard of living, that their experience with railroad rates and railroad stocks led them into the fight for railroad regulation after 1870, and that the inadequate credit system, the prevailing methods of taxation, commission men and middlemen, and the high tariff were all subjects of frequent complaint. He further indicates that conditions were worse rather than better in the five years following the crisis of 1873.

But he also says in the opening chapter of his study of the Granger Movement that "it would be untrue to say that the conditions of American farmers were retrograding in the decade following the Civil War." And it is interesting to note that the Grange organization reached its height in 1873 and 1874. Only 4,000 of the 20,000 granges which were in existence in 1874 survived in 1878.[22] And Allan Nevins concluded that, although "the farmer still endured a multitude of hardships and many injustices," there was marked improvement in his economic welfare after 1875 as contrasted with the decade following the Civil War.[23]

Scattered references to the condition of agriculture are found in the Annual Reports of the United States Commissioner of Agriculture for the period 1870 to 1880. The Commissioner reported "the foundation interest of the country (agriculture) as prosperous and productive in high degree in 1870," and this was reiterated in 1873.

Agricultural Statisticians' reports for the period tend to dwell on the volume of agricultural production and trade rather than upon price, although occasional discussions of price and income can be found. In 1875, for example, the statistician pointed out that a very large crop of cotton failed to yield as great a return as a smaller crop, and that the same held true for corn. Again in 1876 the statistician noted that the farmer "has seen the price (of cotton) decline 37 percent by an increased production in a single year of 38 percent." But in the same report the statistician devoted almost eight consecutive pages to the listing of farms and plantations on which exceptionally high yields of cotton had been obtained.

In 1877 the statistician delved into the "philosophy" of the prices of corn and wheat. In the case of corn, he found that "there

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[22] This brief discussion is based upon Buck, S. J., "The Granger Movement," Cambridge, 1913, Chapter 1, and Buck, S. J., "The Agrarian Crusade," New Haven, 1921, Chapter 5. The brief but spectacular rise in the Grange coincided with the short two-year period in which the relative purchasing power of agricultural products was depressed by the slight rise of non-agricultural prices which was abruptly ended by the crisis of 1873.

[23] Nevins, A. J., "The Emergence of Modern America," New York, 1927, Chapter 13.

is to the farmer a consolation in the law of compensation involved in the effect of quantity upon value and production," since the value of each acre of corn was greater in years of low production than in years when good yields were obtained. And in 1878 it was noted that wheat prices had settled to a lower point than in any previous year as a result of the general decline of values to a specie base, but this was qualified by a statement that the decline did "not indicate a loss to farmers at all in proportion to the figures," since the price of manufactured products also had declined, and since cheap wheat enabled American farmers to undersell other producers in the export market.

And in 1880 the statement that "our farmers have rejoiced in the realization of higher rewards for agricultural labor than during any other continuous four years in our history" was made by the Commissioner himself. In brief, the Commissioner and his statistician were much more interested in production than in prices—they seemed to assume that prices would take care of themselves as production increased.[24]

V

A comparison between the situation of agriculture in the depression which began in 1873 and in the depression which began in 1929 is of interest. Both 1873 and 1929 followed a war period in which prices had been inflated so that the reaction which followed the speculative crash was in each case intensified by the accompanying deflation. (See accompanying chart).[25] In addition, both depressions were world-wide and were marked by a considerable volume of unemployment and social unrest.

But the similar aspects are more than outweighed by the dissimilarities, which are easily apparent. *First,* the depression of 1873 occurred at a time when considerable acreages of free land still were available and at a time when railroad companies, states, and others were anxious to sell land which they had acquired from the Federal Government. Population was growing rapidly, but surplus workers could be diverted with reasonable ease from one occupation to another when and where such diversion was needed.[26]

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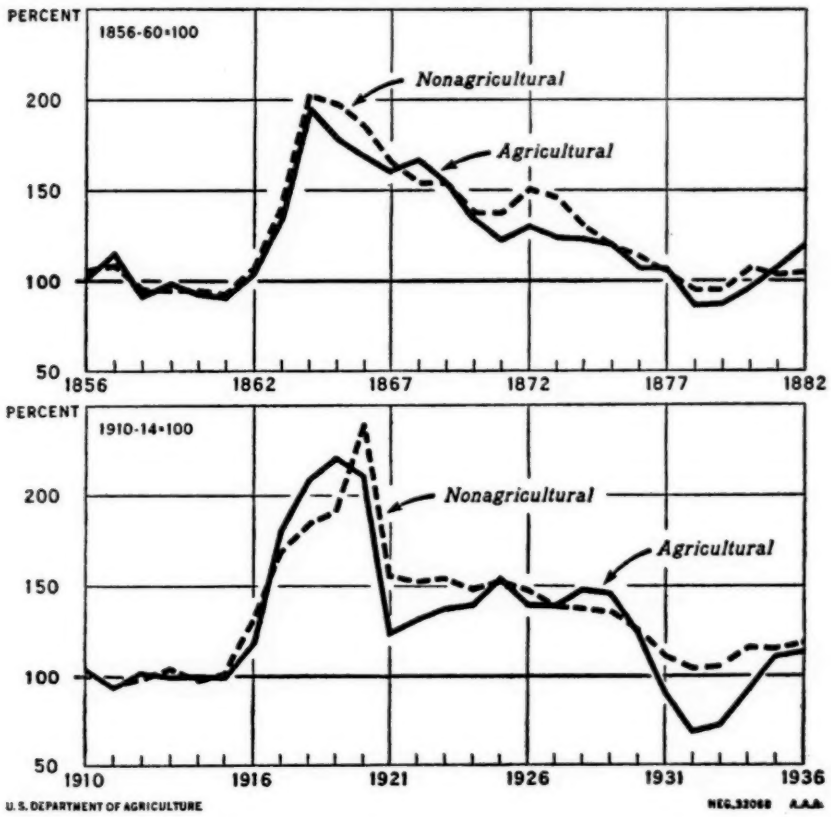
[24] These quotations are from the annual reports of the Commissioner of Agriculture for the period 1870 to 1880, as published by the Government Printing Office, 1871-81.

[25] The data charted are the prices of agricultural and nonagricultural products, excluding the food group, as compiled by Warren and Pearson for 1856-82, and by the Bureau of Labor Statistics for 1910-36. It should be noted that these are not the same series as the indexes of prices received and prices paid by farmers in the farm and retail markets which were used in calculating parity prices under the Agricultural Adjustment Act.

[26] "Surplus" workers in the sense of incoming immigrants and natural increase in the farm population rather than workers forced out of industrial employment. See Shannon, F. A., "The Homestead Act and the Labor Surplus," *American Historical Review*, July, 1936.

In contrast, our agricultural acreage had been over-expanded in 1929, so that considerable areas of submarginal land were in cultivation in the Great Plains Region and the population which flowed from cities to farms from 1930 to 1933, for the most part, could only expect to find a place on which to live or exist, rather

INDEXES OF AGRICULTURAL AND NONAGRICULTURAL PRICES, 1856-82 AND 1910-36



than a place to work. The census statistics for the two periods clearly show the difference, since both the number of farms and the acreage of improved land in farms increased about 50 percent between 1870 and 1880, while an increase of almost 10 percent in the number of farms between 1930 and 1935 was apparently accompanied by a slight decrease in the actual acreage of cultivated land.

Second, the foreign market was expanding during the depression of 1873. Not only was agricultural production increasing at

a rapid rate in this country, but England, and to some extent the other countries in Europe, were willing to accept increasing supplies of American grain and American meat.

In contrast, in 1929 the foreign market for agricultural products was contracting and almost every European country, including England, was exerting itself to maintain agricultural prices and increase agricultural production within its own borders as a result of the nationalistic spirit which had prevailed since the World Ward, and as a defense against the effects of the depression itself.

Third, in 1873, although prices were falling and there was some industrial unemployment, such indexes as are available indicate that manufacturing and mining output were maintained or slightly increased through the period.[27] Both the total national income and gross farm income were apparently maintained at a reasonably stable absolute level through the greater part of the decade from 1870 to 1880, while the total national wealth showed an increase of 45 percent.[28]

In contrast, industrial production in the United States declined over 35 percent from 1929 to 1933.[29] Total national income decreased over 40 percent, farm income decreased 50 percent, and the total national wealth was sharply contracted, with the value of all agricultural property decreasing slighty over 30 percent from 1929 to 1934.[30]

Fourth, in the period following 1873, prices of both agricultural and nonagricultural products gradually declined from the peak which had been reached in 1864 over a fifteen-year period to the low point in 1878 or 1879. Some disparity developed in the two years, 1872 and 1873, but the outstanding characteristic is the gradual downward trend and the maintenance of the relative relationship which had prevailed in the prewar period, 1856-60.

In contrast, the decline from 1920 into 1933 was not gradual, but rather was marked by an abrupt dislocation of the entire price structure in 1920 and again in 1930-32. In both 1920 and 1930-32 agricultural prices fell much farther than nonagricultural prices, and a period of three to four years was required before agricultural prices regained the same relative level with

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[27] It should be remembered that the usual indexes used to show the depth of the depression from 1873 to 1879 are calculated in terms of a trend which was increasing at the annual rate of about three percent.

[28] From $30,062,000,000 to $43,642,000,000, currency basis, as reported in Statistical Abstract of the United States, Government Printing Office, 1933, Table 274.

[29] Federal Reserve Board index of industrial production, as currently published.

[30] Estimated income paid out, "National Income in the United States, 1929-35," U. S. Department of Commerce, Government Printing Office, 1936, Tables 1 and 10, and value of all agricultural property as reported in the Censuses of Agriculture for 1929 and 1934.

respect to nonagricultural prices as had prevailed in prewar years, 1910-14. The difference in the currency and monetary situations between the two periods is clearly contrasted when it is remembered that we were able to go on the gold standard in 1879 and that we were forced off the gold standard in 1934.

A *fifth* factor, which must be classed as accidental, also should be noted. Following the depression of 1873 a succession of short crops in Europe gave an abnormal impetus to agricultural exports and agricultural prices, which formed the basis for the business revival of 1879-82.[31] In the current situation, the drought came in the United States in 1934 and 1936, so that farmers failed to gain by the resulting increases in prices to anything like the extent that they gained in the period 1877-81.

We are forced to the conclusion that conditions in the period 1873 to 1879 were essentially different from those which have prevailed since 1920. In the decade from 1870 to 1880 competition was almost as effective in the fields of commerce, industry, and transportation as in agriculture, as indicated by the parallel decline in agricultural and nonagricultural prices and by the sharp decrease in freight rates between 1873 and 1876. The frontier and the foreign market were still the dominant forces in the American situation. But with all of our land occupied, with competition limited, with the slowing down in the growth of our population, and with the contraction of the foreign market, we are faced with an entirely different situation. If the continuing need for agricultural and industrial readjustment is to be adequately met, or if the recurrence of such situations as prevailed in 1930-33 is to be prevented, a more evenly balanced set of inter-relationships between agriculture, industry, and commerce is needed.[32]

Discussion by O. C. Stine

Bureau of Agricultural Economics

As Dr. Taylor has indicated, historical papers dealing with agriculture such as presented by Woodworth and Wells are valuable both as demonstrating the application of historical methods to research and as present-

[31] With respect to England, Ernle noted that the period 1875 to 1877 was characterized by "bleak springs and rainy summers (which) produced short cereal crops of inferior quality, mildew in wheat, mould in hops, blight in other crops, disease in cattle, rot in sheep, throwing heavy lands in a foul condition, deteriorating the finer grasses of pastures," and that conditions were even worse in the year 1879. Lord Ernle, "English Farming, Past and Present," London, 1922.

[32] A similar conclusion will be found in Ezekiel Mordecai, "Population and Unemployment," *Annals of the American Academy of Political and Social Science, Philadelphia*, November, 1936.

ing facts that have been significant in the development of agriculture. It seems to me equally important to recognize the need of more perspective in dealing with current problems. Dr. Woodworth seems to apologize in the introduction to his paper for his turning aside from attempts at the solution of present critical problems with a view to the formulation of state land policies to explore the history of an area in an old settled country. It seems to me that instead of apologizing, he ought to recognize that such an historical exploration is essential to judging present conditions and probable future developments.

The explorations of Dr. Woodworth have not only revealed some facts that are very interesting in showing that agriculture once seemed to prosper in this area, but they also suggest some interesting questions as to the future of the area. Can one now evaluate lands and opportunities for income in this area in terms of present conditions? It seems rather obvious that it cannot be done. There is no evidence that the process of changing has stopped. His exploration seems to me to show clearly that conditions tomorrow are not likely to be the same as today, and that we should be studying the several forces that are in operation causing changes, to determine what are likely to be the conditions tomorrow.

Incidentally, Dr. Woodworth's paper raises some interesting questions as to assumptions as to who moves when the agriculture of an area is declining. It has been generally assumed that the more progressive and the younger people move. He points to a situation, however, in which the more successful may remain behind because of their success. Undoubtedly the effects of different conditions tending to cause shifts in population differ in terms of age and character of the population as well as in alternative prospects for income.

Dr. Woodworth presents some very interesting data as to current conditions. These data need to be examined more searchingly against their background, to find the current tendencies. To some extent these current tendencies are indicated in the analysis, but this feature of the analysis should be pushed to further limits. The future values of historical research can be demonstrated best by applying more searching analysis in the light of history, to these current tendencies. In his concluding statement, Mr. Woodworth makes well-pointed and significant observations from his historical exploration. I merely want to contribute something toward emphasizing the need of a study of this character in dealing with problems of land utilization in all parts of the country.

The paper dealing with agriculture in the depression of 1873-79 presents an example of how the historical approach may contribute to understanding agricultural price movements in a major depression. This paper contributes to the perspective of major depressions in general, and raises many questions as to the real causes of and real remedies for the recent depression.

This paper makes a real contribution in bringing together many significant facts relating to the depression of 1873-79. As a comparative study, it is short of an adequate development of conditions associated with the recent depression. Mr. Wells presents a very interesting statement of some of the contrasts between conditions associated with the recent depression and that of the earlier years. Looking at the chart of price changes in the period 1919-36 and in the period 1865-82, one may be more

impressed with the similarity than the dissimilarity in the long-period decline of agricultural and nonagricultural prices. Mr. Wells has chosen to deal primarily with the dissimilarities and with the relationships between agricultural and nonagricultural prices. The forces that make for similarity of price movements in the face of the dissimilarity of conditions also should be subjected to searching analysis.